October 1961

Nonwovens—from fiber to market

Tandem cards go 3 times faster

Printing with fiber reactives

Cut yarn defects 20%, labor 30%

Complete contents on page 4

# Textile Industries

a W. R. C. Smith publication formerly "Cotton" fifty cents per copy

University Microfilms
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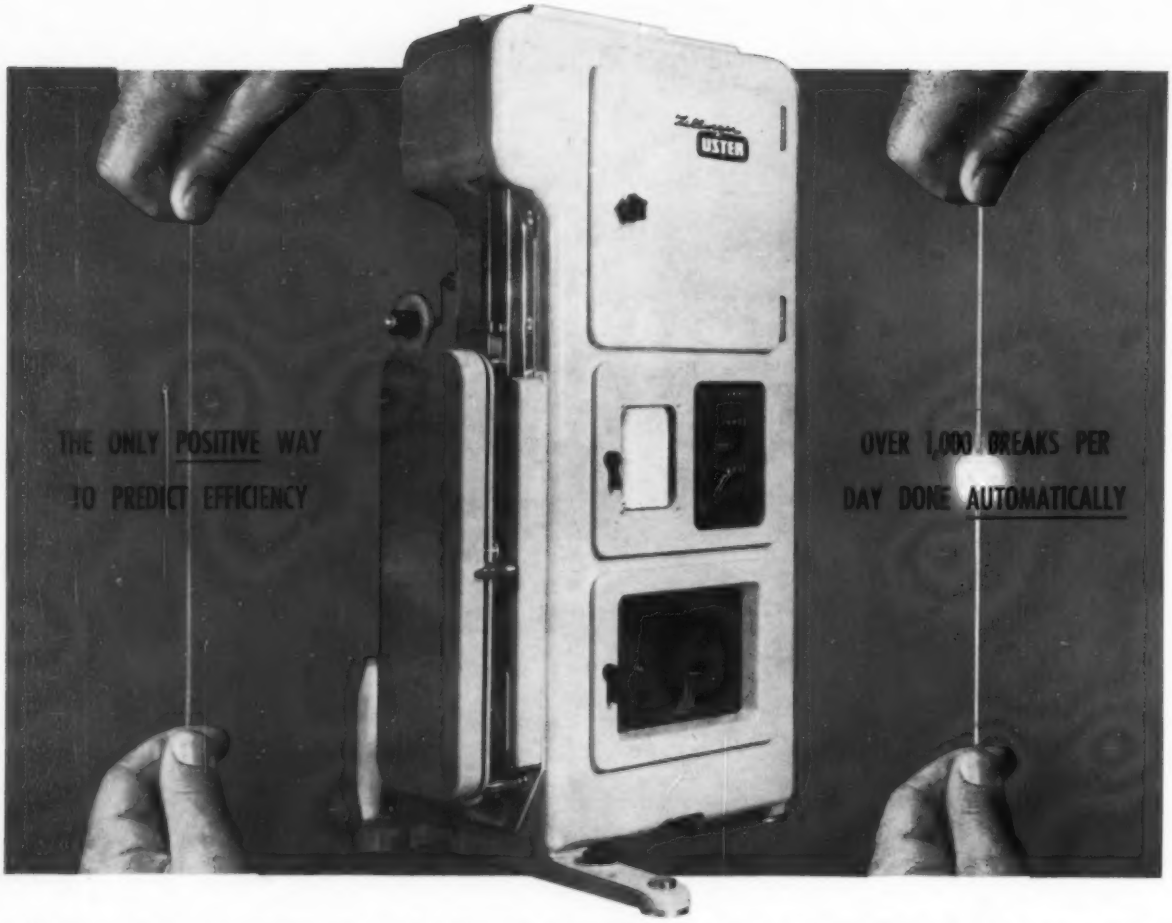
Ann Arbor Mich 4

nonwovens

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Individual indications of the elongation

Sum of breaking strengths

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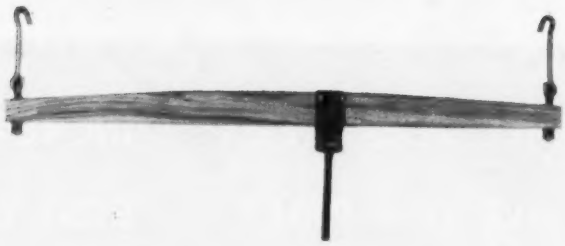

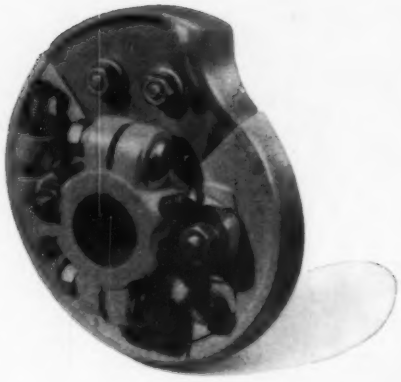

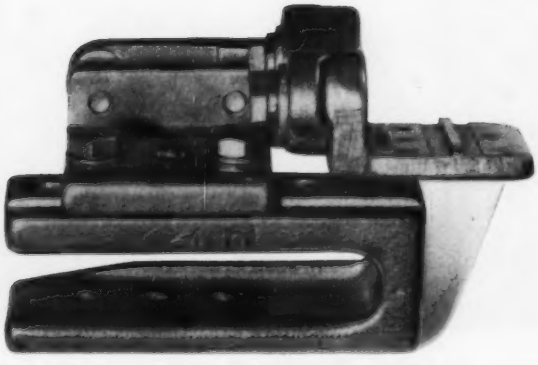

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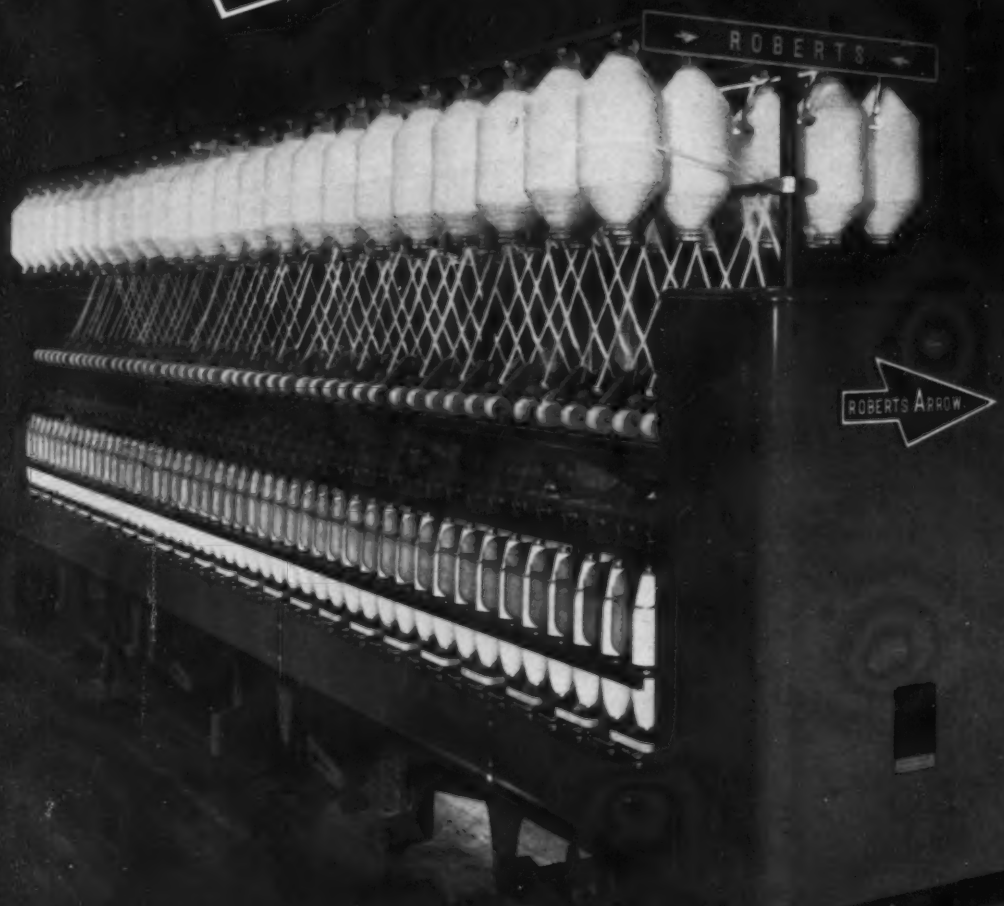


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# ROBERTS ARROW SPINNING.. AN INVESTMENT FOR PROFIT

Profit is the ultimate motive behind the purchase of new spinning or any other capital equipment. And profit essentially depends upon the spread between selling price and manufacturing costs.

In as keenly a competitive industry as textiles, profits are generally determined not so much by high prices but more by high quality coupled with low costs so that products of superior saleability, or value, can be offered.

In yarn spinning, low costs with high quality depend mainly on Versatility, Productivity, and Dependability.

The answer: Roberts Arrow Spinning . . . An Investment for Profit.

## CUTS COSTS AND RAISES QUALITY 10 WAYS

➨ **INCREASED SPEEDS!** 20% to 50% higher, even up to 15,000 r.p.m. spindle speed, achieved by dynamic balancing of all components, plus maximum use of ball bearings.

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➨ **HIGHEST YARN QUALITY!** New Arrow Spinning consistently spins stronger, more even yarns. Superior yarn quality with consistency from bobbin to bobbin is assured by simple, gadget-free drafting systems which provide effective fiber control and uniform weighting on all spindles.

➨ **REDUCED CLEANING, MAINTENANCE!** Elegantly functional, new Arrow Spinning has been designed and engineered for cleaner, trouble-free operation. Simplification of components, fewer parts and streamlined design provides reduced cleaning, more quickly done.

➨ **FULLY BALL BEARING EQUIPPED!** in all moving, turning, rotating and oscillating parts for smooth, dependable performance with substantially lowered electric power consumption. Lubrication requirements are eliminated or minimized.

➨ **SPACE SAVING WIDTH!** Only Arrow Spinning is available in both 25-inch and 36-inch widths. The 25-inch space-saving frame permits installation of five machines in the space formerly occupied by four, increasing spindleage and production by 25% in the same mill area.

➨ **BIGGER, HEAVIER PACKAGES!** Arrow Spinning puts more yarn on the bobbin, tighter wound due to better yarn tension through its frame geometry. Larger rings, longer bobbin lengths and improved bobbin build increase package size and weight, resulting in longer doff cycles plus substantial savings in winding with less knots.

➨ **RUGGED CONSTRUCTION!** and close precision of manufacture and assembly assure quality and long life of Arrow Spinning. Refined and streamlined, free of gadgetry and frills, and engineered for peak performance, new Arrow Spinning features many technological improvements contributing to better, less costly spinning.

➨ **ATTRACTIVE LOW PRICE!** The superior operational economy and productivity of new Arrow Spinning, and its new low investment cost, provide for a quick return on investment.

Installation of Arrow Spinning Frames

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SANFORD, NORTH CAROLINA

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# Textile Industries

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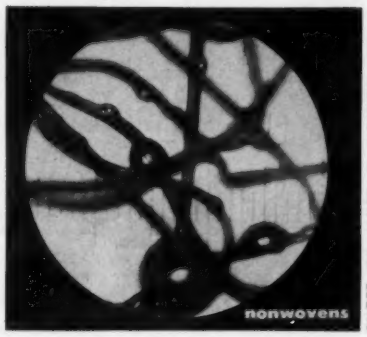


PHOTO BY JAMES W. HOWDEN

Photomicrograph of bonding resin particles in a typical powder-bonded nonwoven fabric, showing superimposed scale used to determine resin concentration and final particle size.

## IN TI NEXT MONTH

### Better spinning

■ NEXT MONTH in TI the Russell Manufacturing Co. will lay bare the performance records of 32 spinning frames equipped with magnetic top rolls. Russell likes the system so well it is equipping 16 more frames. Much of the company's enthusiasm springs from improved bobbin-to-bobbin uniformity, lack of cleaning difficulties, increased apron life, and cleaner cloth.

### Shrinkproofing wool

■ IN TI for November, a way to produce a wool fabric which won't shrink even after repeated washings will be described by its developer, Edwin G. Sutcliffe, chief chemical engineer for Samuel Hird & Sons. The single-bath process is based on amino polyamid and epoxy resins, and is suitable for conventional mill equipment.

### And . . .

■ THESE ARE some other topics we'll cover next month: Details of a stop-motion which a southern mill has installed on 22 cards, with a saving of $10,000 a year; the story behind the rapid growth of Daisy Hosiery Mills; how to determine the best lot size to balance set-up and inventory costs (Article 9 in the series "Modern Textile Management"); and a discussion of the ins and outs of setting spinners' and doffers' job loads.

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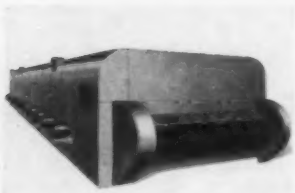

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# SHORTS & REMNANTS

**More on Pegging Import Prices**

"While perusing your 'Shorts and Remnants' in the August issue [page 16] I read with interest your Mr. Walter Mitchell's question on imports and his proposed solution, with the suggestion that it 'may be illegal, immoral, unenforceable, or worse.'

"To set the record straight and in an attempt to answer Mr. Mitchell's question I would like to say that since February 1961 the Combed Yarn Spinners Association has been advocating a perfectly legal method which would accomplish approximately the same thing. In a nutshell this is what we have been proposing:

"Impose an import fee on all cotton products imported, equivalent to the per-pound export subsidy rate with adjustments for waste loss during manufacturing.

"As we all know, there is presently in effect a procedure for the payment of an equalization fee on the cotton content of textile exports—so we believe you could simply use the reverse procedure and apply it to imports. Unless I am mistaken, when the cotton export subsidy program was instituted, it was commonly agreed that two actions would be taken to offset the impact on the domestic industry. First, an offset fee would be collected on cotton product imports; and second, an offset fee would be paid on cotton product exports.

"The second step is in effect—but what happened to the first step? You tell me.

"There are several advantages to this procedure, not the least of which is that it would cost nothing! There are other advantages which I will not enumerate at this time. Perhaps Mr. Mitchell can dig them out himself.

"As we read Section 22 of the Agricultural Adjustment Act of 1933 as amended, especially the last paragraph, subparagraph (b), we see that the President has the authority to take this action without further delay.

"From our point of view this would have the effect of making a 'one-



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# What is ENKA RAYON fashion yarn?

**It's shimmering CREPE...supple, full "bodied," glowing with rich beauty, luxuriating with softness!**

**It's an airy, light SHEER "45"...a fabric with substance, versatility, good manners and cool as only a modern rayon can be!**

**It's a kaleidoscope of COLORS...the pale tints of springtime, the inky blacks of summer, the vibrant tones of fall!**

**It's a PRINT...a jungle of wild flowers, a sophisticated abstract, a geometric, an expression of a textile artist's brush!**

**It's a TEXTURE...pebbly, tweedy, silklike, damasky, smooth as glass!**

**It's a SILHOUETTE...the flare, the sheath, the blouson, the middy, the pleat, the drape!**

**It's PROMOTION...national advertising in top fashion magazines, modern merchandising on a coast to coast basis, publicity in the nation's fashion press!**

**Modern ENKA RAYON yarn adds more than mere filling to a fabric. It's the look, the touch, the shape of fashion TODAY.**

**Check on ENKA RAYON yarn now...contact Enka Merchandising in New York at 350 Fifth Avenue, PE 6-2300 or the District Sales Office nearest you.**

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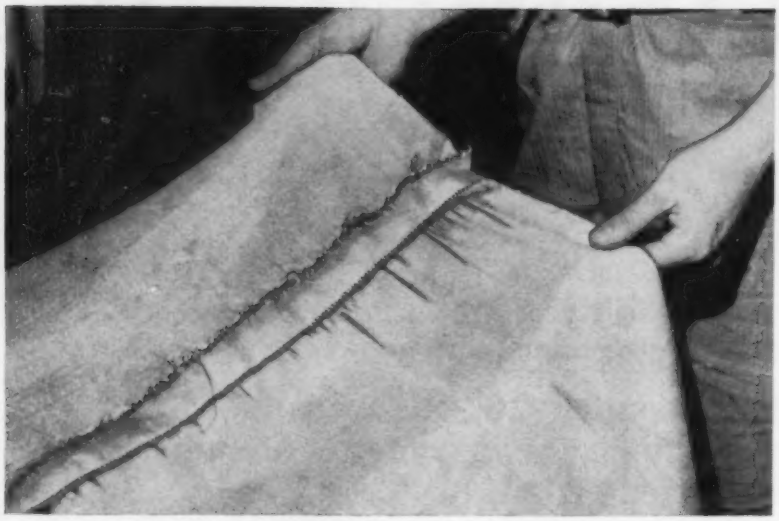

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## SHORTS & REMNANTS

*(from page 6)*

price' cotton without affecting the American farmer's price, and would go a long way towards equalizing the unfair advantage now held by foreign yarn mills—because in our operations cotton costs are a substantial portion of the total cost.

"As you may have noticed, I have not mentioned either tariffs or quotas. We simply want to see existing legislation implemented—not that we are not 100% behind the move for quotas by category by country!"

J. H. CAMPBELL
Executive Secretary
Combed Yarn Spinners Association
Gastonia, N. C.

**TI Unfair to Japanese?**

"In the April issue of your magazine, there appeared an article entitled 'A Story About Three Boys,' which was a reprint from a textile mill employee newspaper. The theme of the piece was: Japanese textile imports and the alleged threat they pose to the jobs of American workers.

"Our organization, the Association on Japanese Textile Imports, Inc., questions many points raised in this article, and we take particular issue to the reference that 'Socialists and Communists . . . are aiding the import program . . .' and 'those who believe in fair treatment for Americans should oppose organized groups who are aiding Khrushchev . . .'

". . . the chances are that less than one out of every twelve cotton bales sold the Japanese mill returned to the U. S. in textile form. During 1960, the Japanese cotton textile industry bought over 1,600,000 bales of raw cotton from the U. S. We received in return only about 130,000 bales in the form of cotton textile imports from Japan. This included not only cotton fabrics, but also madeup items, such as apparel and household products . . ."

GEORGE N. SPITZ
Masaoka-Ishikawa and Associates
New York, N. Y.

No doubt the Japanese did buy 1,600,000 bales of raw cotton from the U. S. last year—and they paid $64,000,000 less for it than the price it would have cost American mills. But if Japan bought our whole cotton crop for the next ten years, a weaver in South Carolina could hardly be blamed for not being impressed if at the same time a weaver in Osaka had put him out of a job.

► In honor of the 16th anniversary



*For further information use Handy Return Card, Page 201*

of the founding of Oliver D. Landis, Inc., as a supplier to the textile industry, we present a picture of their Gastonia, N. C., plant, with the staff (minus two) foregathered out front:

That's Mr. Landis, third from the left. The firm moved to Gastonia from Charlotte in 1958.

► This is, verbatim, a letter we received the other day from a mill in the Philippines:

"I'm sorry the key just in favor of our textile industries dealing w/machinery new design in the yearly magazine. Thanks, for our firm industries complement card."

Just when we thought the writer was getting through to us, we read the letter over again. Now we can only wonder.

**Who Makes Spandex?**

"This is in reference to the article 'Man-Made Elastic Yarns,' by T. B. Marshall, on page 75 of your August 1961 issue of TEXTILE INDUSTRIES. You say that there are seven manufacturers of spandex fibers and we only know of E. I. du Pont Co. and U. S. Rubber Co. Would you please advise us who the other five are?"

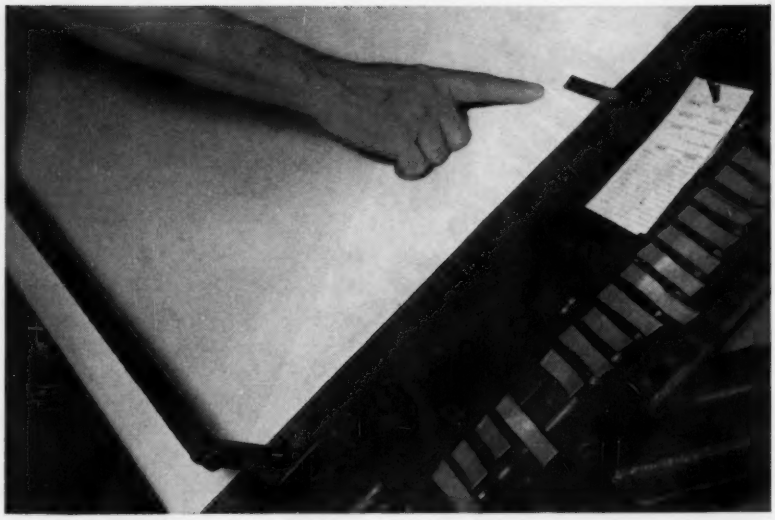
CLAYTON H. MILKS
Works Manager
Tip-Top Hosiery Mills, Inc.
Asheboro, N. C.

We referred this to Mr. Marshall, who replied:

"A number of companies are experimenting with spandex fibers. Except for 'Vyrene,' 'Lycra,' and the fiber used in Playtex bras by International Latex, none has appeared in the trade in any sizable quantity. The four other companies referred to in my article . . . are as follows: United Elastic Corp., Easthampton, Mass.; Globe Manufacturing Co., Fall River, Mass.; Rhee Elastic Thread Corp., Warren, R. I.; and Firestone Tire & Rubber Co., Akron, Ohio."

T. B. MARSHALL
"Lycra" Product Assistant
E. I. du Pont de Nemours & Co.
Wilmington, Delaware

Would any other firm care to be listed as a producer of spandex?



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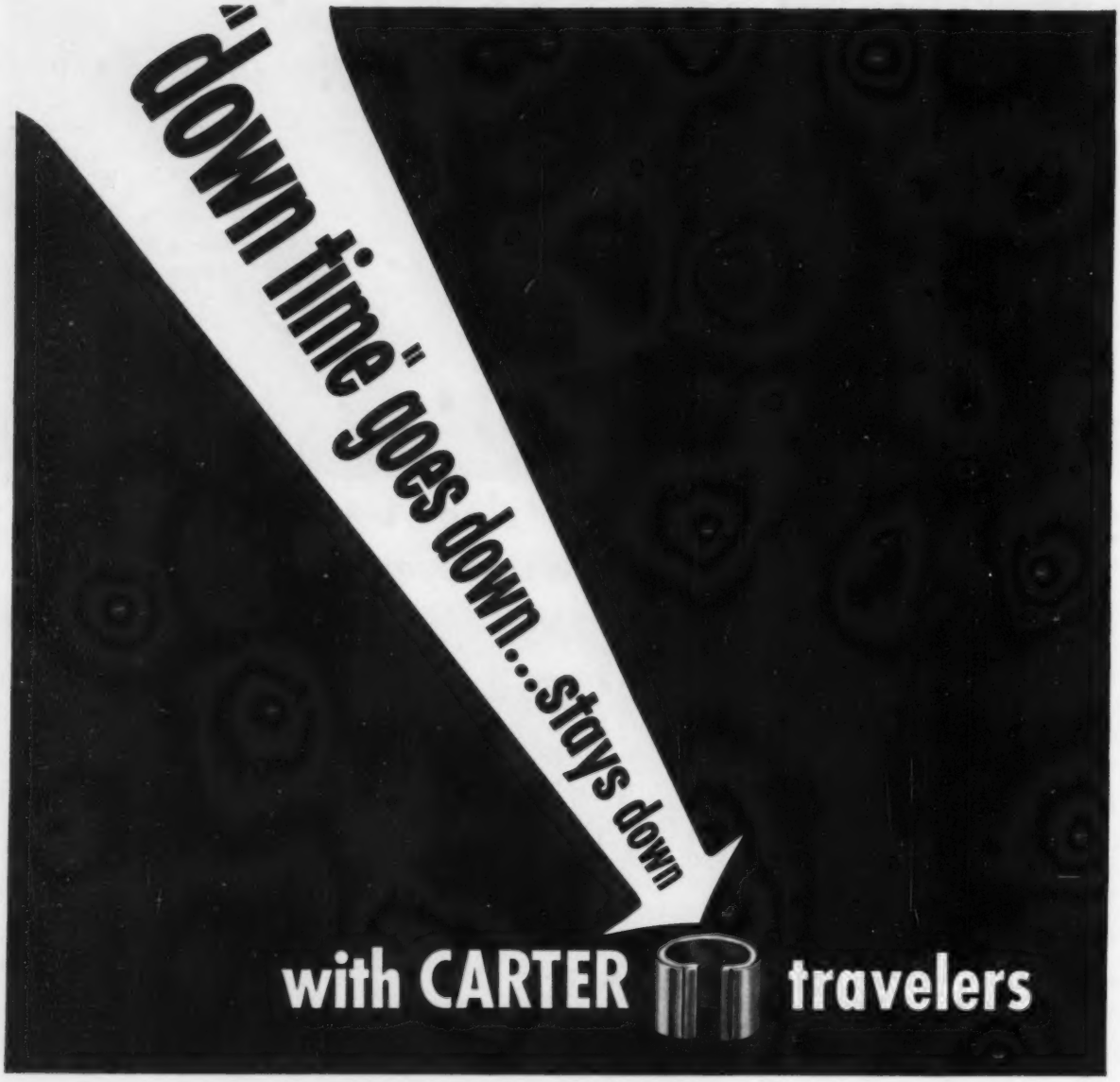


When you specify CARTER TRAVELERS you insure smooth, trouble-free spinning and twisting regardless of yarn count or spindle speeds.

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**IMMUNOL** is non-toxic, odorless

**It won't cost you anything to try IMMUNOL . . . the solvent that's widely used in textile mills throughout the country. Send for free sample today.**

HARRY MILLER CORP. HAMICO 4th & BRISTOL STREETS PHILADELPHIA 40, PA.

*1 part IMMUNOL to 20 parts water is sufficient for all cleaning operations. It costs less than 13¢ a gallon!

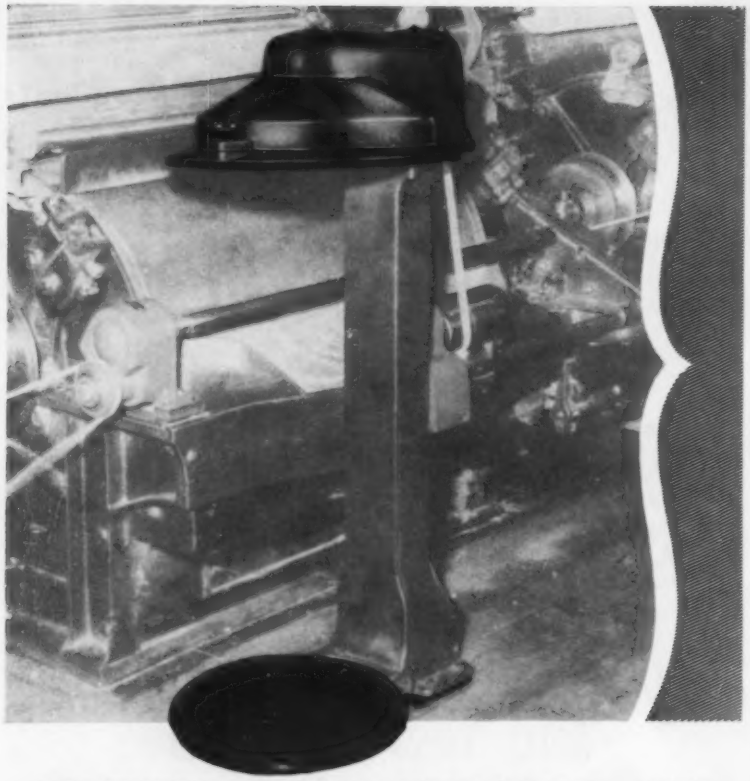
Manufacturers of:
• IMMUNOL • GLYCOLA • POTENTOL
• FIBREGARD • REVERSOL • ACTIVOL
• FIRMTAL

**HARRY MILLER CORP.**

*Original Products and Processes Since 1936*

**4th and BRISTOL STREETS • PHILADELPHIA 40, PA. • DAvenport 4-4000**

*Service Representatives in Principal Cities*



# SOUTHERN STATES' NEW COILER HEAD AND BASE MAKE CONVERSION TO LARGER CANS SELF-PAYING

For mills seeking a low initial cost for conversion to larger cans, Southern States' new conversion unit is the answer. It consists of: 1) the identical, vastly improved ball bearing head used on the new complete coiler; 2) an adapter spacer and upright shaft for increased coiler height necessary to accommodate 36" or 42" cans; and 3) a new, standard-type base assembly with a conventional gear system for driving the can table. All necessary components are furnished in kit form for quick installation, *using your existing stands.*

Southern States' Conversion Units are designed for use on any make cotton card and for accommodating cans of larger diameter.

Case histories of mills prove conclusively that Southern States' conversions are so economical they soon pay for themselves. For a small initial investment, you enjoy all the advantages of more efficient handling; lower operating costs; improved quality; simplified oiling; ease of maintenance; smaller parts inventory; and years of satisfactory service.

Get full facts from your Southern States representative or write direct to us for Technical Bulletin No. 205.

SS
SOUTHERN STATES
HAMPTON, GEORGIA

## SUPPLIER NOTES

**United States Rubber Co.** has announced the completion of an expansion program at the Gastonia (N. C.) plant that will double production facilities of Vyrene, the company's new spandex thread. * * * Joseph B. Jackson has been named field sales manager of the textile division's western district. W. Lindsay Wylie has succeeded Mr. Jackson as sales manager of tufting, chenille, and floor covering yarns. * * * Claude H. Allard has been appointed director of marketing of the Naugatuck Chemical division.

**Eastern Color & Chemical Co.** has announced the appointment of Matthew M. McCann as technical service and sales representative. Mr. McCann will service southern textile plants from his headquarters in Burlington, N. C.

Richard H. Dillinger has been appointed manager of starch sales, a newly-created position at **Morningstar-Paisley, Inc.** Mr. Dillinger will coordinate and be responsible for sales of bulk and modified tapioca and potato starch as well as promotion of ethylated, oxidized, and cationic starch derivatives, dextrine products, and pregelatinized starches.

The new plant facilities of Scott Testers (Southern), Inc., a subsidiary of **Scott Testers, Inc.,** has been completed. * * * George H. Miller has been appointed executive vice-president.

Robert F. Roth has been named merchandising manager of **Metals & Controls, Inc.,** a division of Texas Instruments, Inc.

**Proctor Chemical Co.** has begun a $250.000 expansion program to enable the firm to process new products developed locally for the textile and chemical industries.

Leslie L. Walmsley of **American Viscose Corp.** has been assigned technical service responsibilities to



*For further information use Handy Return Card, Page 201*

Mr. Stafford
*Turbo*

Mr. Heard
*Penick & Ford*

the dyeing and finishing trade. Mr. Walmsley will maintain his headquarters at Marcus Hook, Pa.

A $5,000 scholarship has been established at the Philadelphia College of Textiles and Science by **Singer-Fidelity, Inc.,** to honor Walter Larkin, recently deceased senior inventor of the company.

A new firm, **Chemol, Inc.,** has been formed in Greensboro, N. C., for the manufacture of chemicals for the textile industry. Stanley Frank is president.

E. Leland Jordan has been named to the newly created post of executive vice-president for Utex, Inc., sales division of **U. S. Textile Machine Co.**

**Louis P. Batson Co.** has announced the receipt of an order from Cone Mills Corp. for eight complete one-process Permo spinning systems, for installation in the Proximity plant.

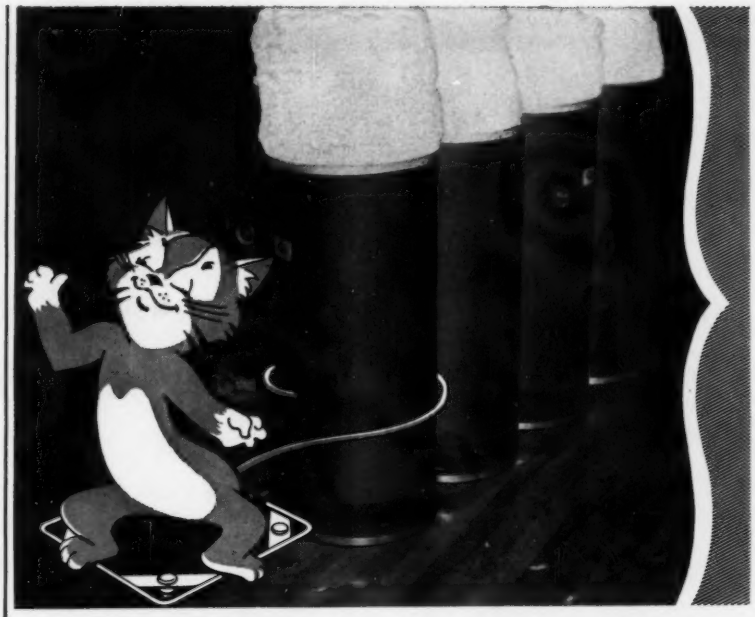
Charles L. Tidwell, Jr., has been appointed representative for North Carolina, South Carolina, and Georgia for **Sjostrom Automations, Inc.**

John R. Stafford has been named to head the new southern sales and service office of **Turbo Machine Co.** located in Charlotte, N. C. * * * Geo. Alan Carruthers has joined the firm in Lansdale, Pa. Mr. Carruthers will work in the research and development division.

**Penick & Ford, Ltd., Inc.** has announced the creation of an autonomous Pacific sales territory for the corn refining division. Harold A. Harvey has been named sales manager. * * * J. R. Heard has been appointed industry manager of textiles.

Robert F. Thayer, district manager of the fibers division sales office for **American Viscose Corp.,** has retired. Stanley G. Haskins has been named

*Continued on page 16*

# SOUTHERN STATES ALLEY-SKAT* SLIVER HANDLING SYSTEM SPEEDS DOFFING AND CONVEYING BIG CANS

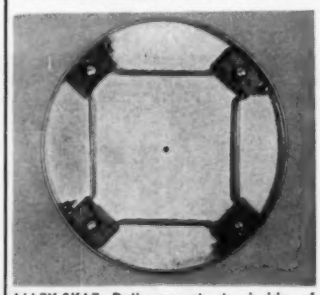
As mills convert to large diameter coilers—with cans weighing up to 12 times more than those of only a few years ago—doffing and moving heavier cans presents a problem. Yet it can be solved simply and economically with Southern States' exclusive ALLEY-SKAT system.

This unique system consists of a can dolly easily affixed to the bottom of any size can, a specially designed cantable, and latches to permit train-like movements of several cans by one man. The ALLEY-SKAT system can be used on cans 16 through 30 inches.

On new coilers, Southern States supplies the ALLEY-SKAT cantable at no additional cost. The only extra cost is for the ALLEY-SKAT dolly and latches for the system.

Get full information on this unique handling system from your Southern States representative or write for Bulletin 502.

Patents 2,816,328; 2,823,924; 2,908,945; 2,916,780; 2,920,902; 2,936,496; 2,950,021. Others pending.



ALLEY-SKAT Dolly mounts to inside of can rim. Dollies are made of finest materials. Heavy-duty unit shown is for 24" and 30" cans.

Cantable adapter plate is available as standard equipment on Southern States Coilers at no extra charge.

Doffing of large, tightly packed cans is quickly and easily accomplished. No lifting required.

*TRADEMARK

SOUTHERN STATES
HAMPTON, GEORGIA

*Carl Garrison, Spinning Foreman at Aberfoyle Manufacturing Rex Mills, Plant No. 1, Gastonia, N. C., listens as Tom Vernon of Armstrong points out the characteristics of Accotex NO-7876 aprons, which are used on this frame. J-490 front-line cots and NC-762 back-line cots are also used.*

# *Spinning synthetics or blends? Accotex cots and aprons will help you maintain high quality*

Synthetic fibers and blends are premium materials. Production lost by excessive lapping . . . or yarn irregularities caused by poor fiber control . . . can be expensive. That's an important reason to pay extra attention to the selection of your spinning cots and aprons.

In this important selection job, hundreds of mill men consult with their Armstrong man. These mill men know that the Accotex line contains a wide choice of roll coverings and aprons that are engineered to turn out quality yarn with any fiber or blend . . . and on any drafting system.

They also know that an important part of every transaction with Armstrong is the skilled, helpful service of their Armstrong man. A good example is Armstrong man Tom Vernon, shown here working with personnel of Aberfoyle Manufacturing Rex Mills, Plant No. 1, Gastonia, North Carolina.

Be sure to call *your* Armstrong man on any roll covering or apron problem. Armstrong Cork Company, 6210 Ivy Street, Lancaster, Pa.

ACCOTEX® IS A TRADE-MARK OF ARMSTRONG CORK COMPANY.

*P. F. Anthony, Carding Foreman, chats with Tom about the performance of this roving frame which is equipped with Accotex J-490 and NC-762 cots.*

*Frank L. Rhyne, Superintendent of Aberfoyle Manufacturing Rex Mills, Plant No. 1, discusses with Tom the characteristics of a new Accotex cot.*

**For further information use Handy Return Card, Page 201**

*E. M. Driscoll, Director of Technical Services, checks out a Uster evenness chart with Tom.*

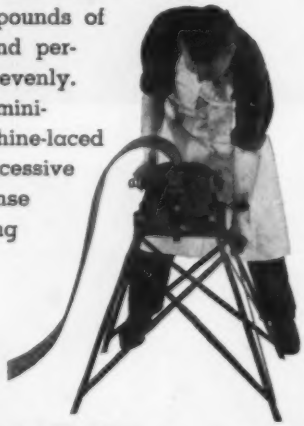
**Armstrong**
**ACCOTEX COTS AND APRONS**

# MAINTENANCE SAVINGS COME YOUR WAY with

# Clipper

## HOOKS and LACERS

Even on small-diameter rollers like the one shown above, Clipper machine-laced joints are smooth and flexible and give longer life. Hooks are firmly imbedded flush with the belt surfaces and clinched by up to 45,000 pounds of pressure. Double-staggered gripping and perfectly rounded loops distribute strain evenly. Wear on hooks, belts and machinery is minimized by smoothness of the Clipper machine-laced joint. There is no pounding to cause excessive wear. Save maintenance time and expense and cut unproductive downtime by using Clipper hooks and lacers.



**FOR MORE INFORMATION**

*Detailed product information and case history examples of Clipper machine-lacing benefits are contained in Bulletin No. 157. Send for your free copy today.*

*Ask your Industrial Distributor for Clipper Products*

Clipper BELT LACER COMPANY

980 Front Ave., N. W., Grand Rapids 2, Michigan

## SUPPLIER NOTES

*(from page 13)*

to succeed Mr. Thayer. Richard H. Braunlick has been named manager of research and development. • • • Kenneth B. Mitchell has been appointed sales representative for the film division in North and South Carolina.

Frederick W. Roberts has been elected vice-president of research and development for **Whitin Machine Works.** • • • Jackie W. Calvert, of the Spartanburg, S. C., office sales staff, has been transferred to the Greensboro, N. C., office. Mr. Calvert has replaced Walton V. Byers, who has retired.

Edmond J. McLevedge has been named a sales representative in the New York sales district for **American Cyanamid Co.**

**Greenville Textile Supply Co.** has been named a southeastern distributor by **Extremultus, Inc.**

The **Square D Company** has announced the completion of a 10,000 sq ft addition to the warehouse facilities in Atlanta, Ga.

Dr. R. H. Whitehead has been elected chairman of the board of directors and George H. Miller has been elected president of **Scott & Williams, Inc.**

**Texaco, Inc.** has announced the new address of the New York sales division office as 2100 Hunters Point Ave., Long Island City 1, New York.

Hans Seifert, formerly technical sales representative, has been appointed sales manager of the chemical division of **Sandoz, Inc.**

**American Rieter Co., Inc.** has announced plans to construct a plant in Spartanburg, S. C., within one year.

George J. Motz has been promoted to assistant manager of the New York-Philadelphia sales district for **Becco Chemical Division** of FMC Corp., formerly Food Machinery and Chemical Corp.

Ivan W. Benson has been appointed sales representative for **Barrington Industries, Inc.,** to call on the trade in North and South Carolina, Geor-

*Continued on page 44*

# ANNOUNCING

## a New Concept in Loom Parts Cataloging

IMPROVED LOOM PARTS
HFL
LOOM PARTS
Custom engineered to solve weave room problems
H. F. LIVERMORE CORPORATION
Partners in the Textile Industry since 1887

**Here is the First of Two New HFL Catalogs of IMPROVED LOOM PARTS**

**Another First in the Textile Industry from H. F. Livermore . . . a Catalog of HFL Improved Loom Parts, Individually Prepared for Each Customer's Replacement Requirements for the following Looms: E, K, P, Modified D, X, X2, L, O, XL, XD, XK, XP**

Catalog consists of any one, or any combination of, four Divisions of your choice. Divisions list HFL Improved Loom Parts available for the following looms:

| | |
|---|---|
| Division I | Models E, K, P, and Modified D |
| Division II | Models X, X2 |
| Division III | Models L, O, XL |
| Division IV | Models XD, XK, XP |

Designed for quick reference and easy identification of parts, the new Catalog lists over 1,000 HFL Improved Loom Parts, with more than 60 carefully prepared drawings of major Motions, Assemblies, and Components.

Write today for your Free HFL Catalog. Please specify which of the Divisions (I, II, III, IV) should be included to fit the replacement part requirements of *your* loom equipment.

**HFL**

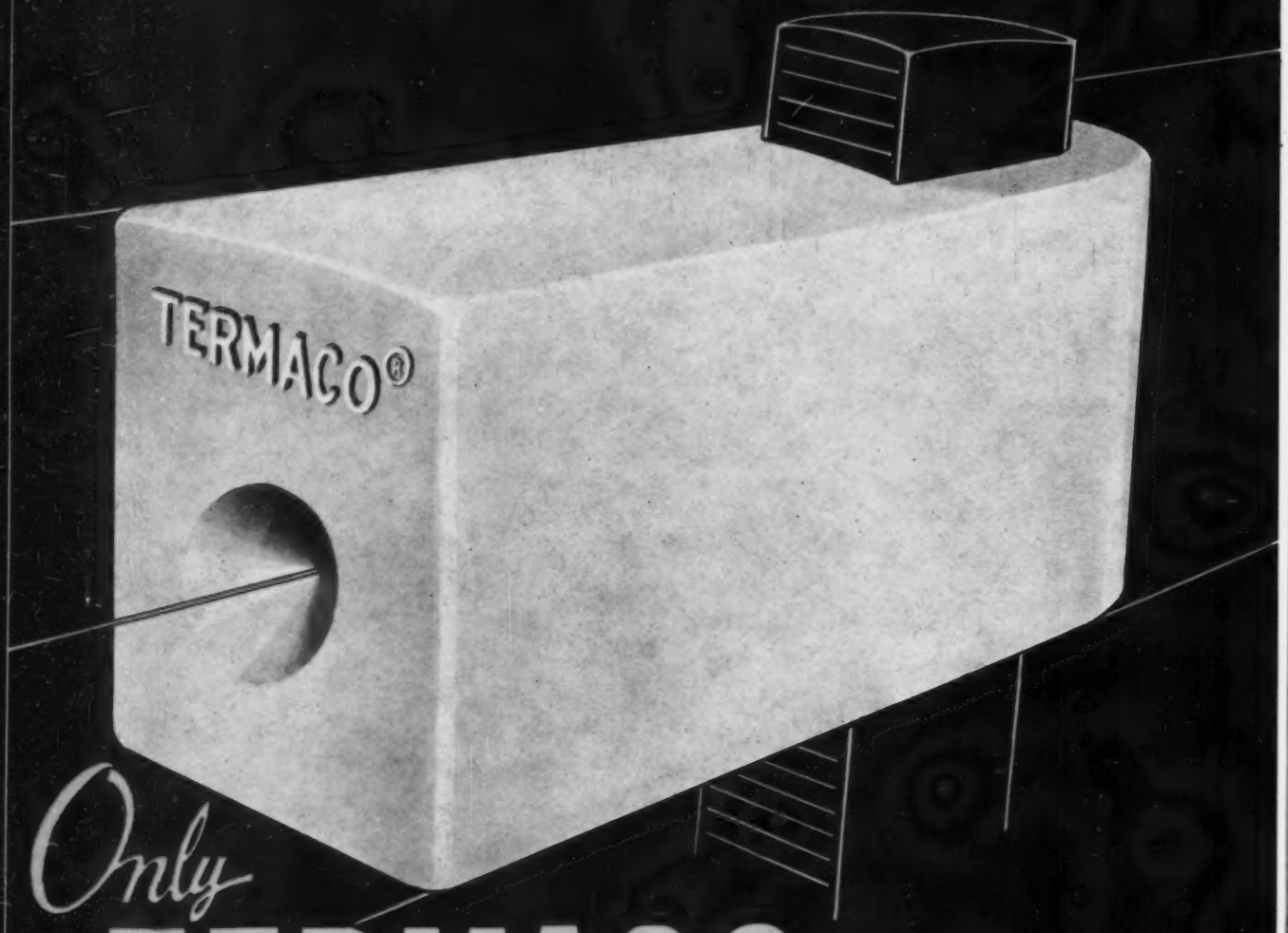
IMPROVED LOOM PARTS

**H. F. LIVERMORE CORPORATION**

ESTABLISHED 1887

EXECUTIVE OFFICES & PLANT
BOSTON 34, MASS.

SOUTHERN DIVISION
GREENVILLE, S. C.




*Only*

# TERMACO

*LIGHT COLORED PICKERS*

have a firmly established, production proved

record of **LOWEST COST PER LOOM PER YEAR**

MADE BY DENMAN RUBBER MFG. CO. WARREN, OHIO

**THE TERRELL MACHINE CO., INC.**

CHARLOTTE, N. C.

# NEWS IN BRIEF

**Greenville Show to Get New Home.** The next Greenville Show, 22nd Southern Textile Exposition, scheduled for October 15 - 19 next year, will be the last of the series of Expositions to be held in the

present building. In 1964, Textile Hall Corporation, which owns the present building, will have ready a new 160,000 sq ft building (expandable to 300,000 sq ft) on a 30-acre location adjoining the Greenville Municipal Airport. Already Textile Hall Corp. has mailed applications to some 500 possible exhibitors for the 1962 show, receiving about 250 tentative space requests. Space assignments and contracts will be mailed this fall, management of the biennial event has announced.

**Picker-Lap Import Scope Bared.** Recent figures released by the National Cotton Council show picker-lap imports (TI for September, page 17) last year approximated 50,000 bales of cotton, 1½ times the raw cotton import quota. The cotton enters the U.S. as manufactured goods and much of it avoids even the tariff normally imposed on textile imports. Most of it now enters through the foreign trade zone in New Orleans, duty - free and unhampered by quotas, where it can be made into picker laps without being subject to the normal 5% duty. The number of pickers in that zone grows steadily, by now should be sufficient to process the equivalent of 92,000 bales yearly. Machinery for producing the laps is being set up in the new foreign trade zone of Puerto Rico; and production from the machinery in place on the Mexican and Canadian borders should approximate that from the trade zones. The volume could easily reach a figure 6½ times the raw cotton import quota, which means that amount of cotton will have to remain in the government loan program, cotton acreage controls redrawn to offset the change in demand, etc. Loan cotton now is sold to foreign mills at 8½ cents per pound less than to domestic mills.

**AEC Textile Study Report.** The Atomic Energy Commission has compiled a 72-page research report entitled "Applications of Nuclear Radiation and Radioisotopes to

Textile Materials and Processes." Copies are available for $2.50 from Office of Technical Services, Department of Commerce, Washington 25, D. C. Order number: NCSC-2477-1.

**A Look Through the Yen.** Japanese cash wages, according to the United States-Japan Trade Council, Inc., 1000 Connecticut Ave., Washington 6, D.C., in 1957 averaged 26¢, compared to $2.07 in the U.S., 65¢ in Great Britain, 51¢ in West Germany, 44¢ in France, and 33¢ in Italy. But Japanese wages, now on the upswing, are supplemented with fringe benefits often having cash value three times actual wages. As for purchasing power, the U.S. worker has to pay about $1.00 for: vegetables that cost the Japanese about 30¢; fish that cost him 35¢; clothing he gets for 50¢; grain, 57¢; etc.

**Top Brass Earnings up 6%.** Despite a 10% cut in profits, chief executives in the textile industry earned 6% more in 1960 than in 1959. Other disclosures of the McKinsey & Co., Inc., survey (587 companies, 25 industries) show interesting trends: for the second year running, top textile executives fared as well or better in compensation increases as top managers of industry in general; they were the only top men to score better gains than their hourly em-

"Top 10 Plants" Award Winner

# HANES HOSIERY MILLS'

## WEEKS DIVISION

*Fully air-conditioned by Bahnson*

***Consulting Engineers: Davidson and Shepard***

16-acre Weeks Division Plant requires 3300 tons of refrigerated air-conditioning.

Inspecting the air-conditioning in the modern Looping Room of the Weeks Division are Hanes Board Chairman R. B. Crawford and Agnew Bahnson, Jr., President, The Bahnson Company.

## Factory Magazine Cites Hanes Plant for "Overall Excellence in Planning and Construction"

Bahnson Central Station Systems at the new Weeks Division Plant provide year 'round air-conditioning, custom-designed to suit each step in Hanes' integrated manufacturing process. Hanes Board Chairman R. B. Crawford praised the Bahnson air-conditioning installation and its operational efficiency. The Bahnson Company takes pride in being part of Hanes' nationally acclaimed Weeks Division Plant.

Call in Bahnson when you have air-conditioning problems or plans. Bahnson specialists are backed by almost a half century's experience in industrial air-conditioning.

Bahnson

AIR-O-MATION

THE BAHNSON COMPANY • WINSTON-SALEM, N. C.



*For further information use Handy Return Card, Page 201*

ployees; last year's gain puts them close to the all-industry averages for companies of comparable sales; there is less gap between the second, third, and fourth highest paid than in any industry except one of the 25 surveyed; and new chief executives earned more than their predecessors.

**NAHM Meet Set.** The National Association of Hosiery Manufacturers will meet at Bal Harbor, Fla., in the Americana Hotel, April 25 - 28, 1962 for its 58th annual

convention and its second in that city. Usually, the Association meets in Atlantic City, N. J., in odd-numbered years to time with the Knitting Arts Exhibition.

**Industrial Health Programs.** Most American companies now have some form of industrial health program, the Bureau of National Affairs reports after surveying 171 firms across the country. Every one of the firms had at least some of these: in-plant health services, outside-the-plant services, physical examinations, industrial health staff, executive health programs, and others. The programs pay for themselves, over 90% of the firms said. Reasons: reduced insurance premiums, less lost time from injuries and accidents, lower absentee rates, and improved employee morale.

**More 100% Wool.** Production of men's and boys' wear wool fabrics dropped 22% in the first quarter of this year compared with last, but blends were harder hit than all-wool fabrics. In fabrics making up about three-quarters of the total, 100% wool fabrics accounted for 72% this year compared with 67% in 1960. The picture in women's wear was similar: Production was down 8%, but in fabrics making up about 90% of the total, all-wool fabrics increased their share from 62% to 68%.

**Help for Small Export Firms.** The offices of Secretary of Commerce and Small Business Administration announce a cooperative enterprise to expand foreign trade by assisting small firms to do busi-

ness abroad. Under the agreement, SBA will help the would-be ex-

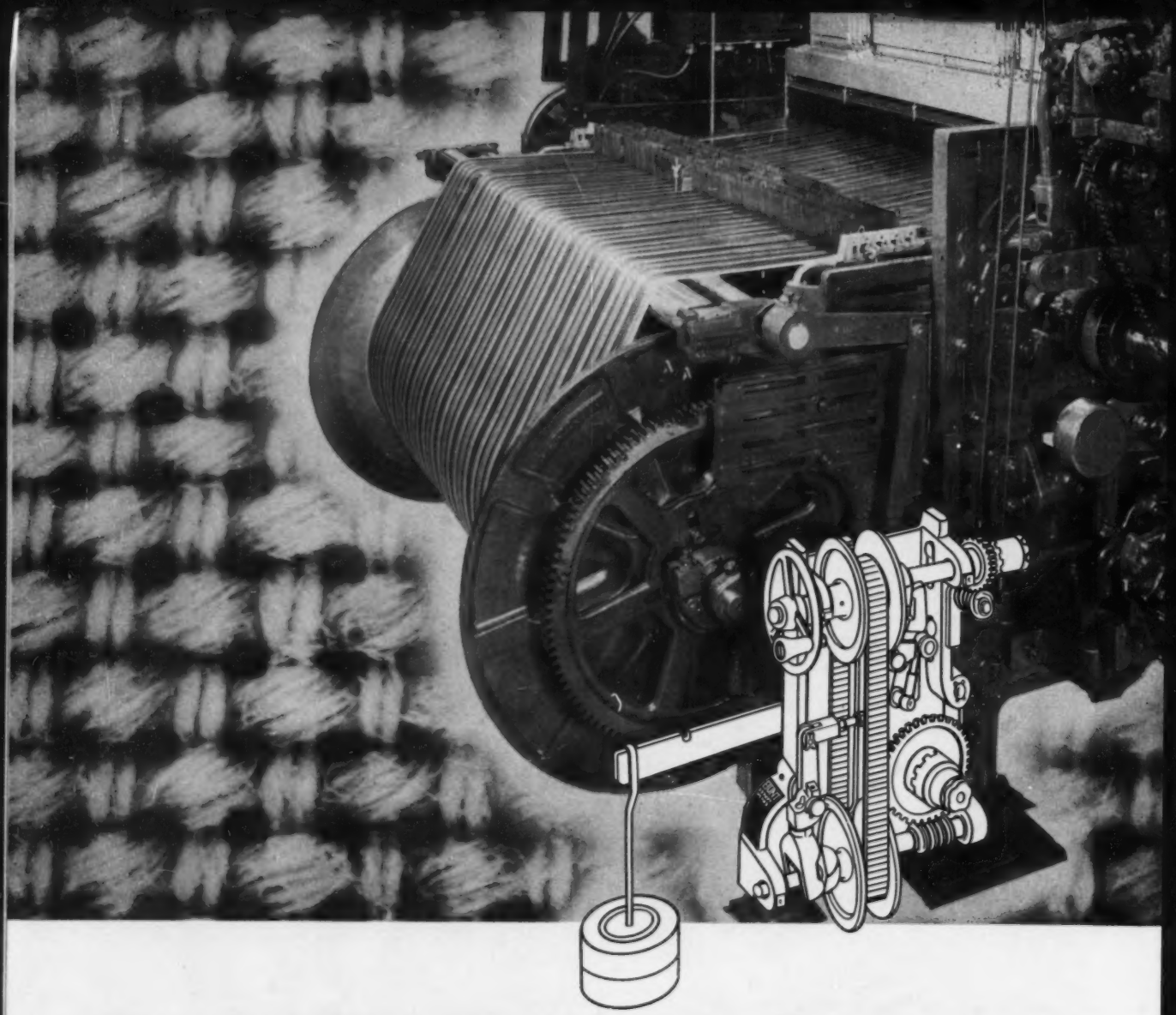
## Labor-Management News

**Union Wins.** Employees of Cone Mills Corp., Salisbury, N. C., voted 321 to 234 to affiliate with TWUA in a recent election held by the National Labor Relations Board. The union lost similar elections in 1956 and 1958.

**Employees Get Wage Hike.** The Arnold printing division, North Adams, Mass., of Indian Head Mills, Inc., and TWUA have agreed on a 5-cents-per-hour pay increase and added insurance benefits. The 650 employees have been working under a 30-day extension of the old contract.

**Plant Held Not Guilty.** Management of Vermont Hosiery and Machinery Co., Northfield, Vt., is not guilty of unfair labor practices, ruled the Washington, D. C., office of the NLRB. While nonunion workers remained on the job, UTW members went out on strike on June 19, later claimed the company failed to meet with the union to negotiate a new contract and aided in efforts to decertify the union as bargaining agent.

*"Be sure to let us know if they try to open again."*



# YOU WILL SELL MORE CLOTH!

**You'll Sell More Cloth**
When you apply the Hunt Let-Off® to your looms in use or specify it on new C & K or Draper Looms.

**You'll Sell More Cloth**
Because the Hunt Let-Off eliminates wavy lines and thick-and-thin places that cause the "hungry" look.

**You'll Sell More Cloth**
Because the Hunt Let-Off does away with set marks due to loom stops to adjust tension.

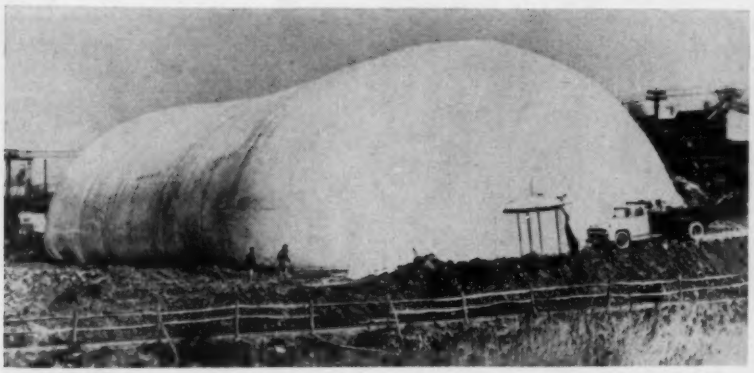
**You'll Sell More Cloth**
Because the Hunt Let-Off controls the warp beam on your loom, maintains constant, even tension from full to empty beam. Result: your perfect cloth is measured in miles instead of yards . . . your sales and profits on the rise.

**For complete details about the Hunt Let-Off, write, wire or phone for free booklet.**

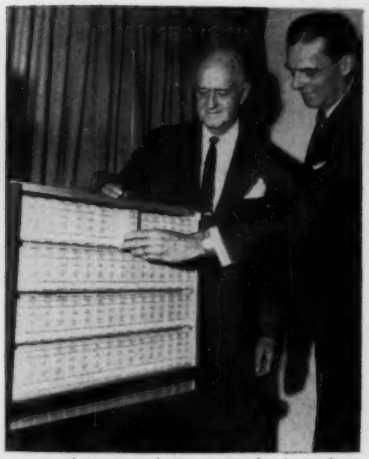
**SOMACO®**

**SOUTHERN MACHINERY COMPANY**
**P. O. Box 600 • Brushy Creek Road**
**Greer, S. C. • Phone 877-8432 • TWX Greer 6130**

**In Europe or India:**
Casablancas High Draft Co., Ltd.
Bolton St., Salford 3, Manchester, England



Old Man Winter stared pop-eyed at the cause of his shortness of breath. Rising out of a muddy field at North Bergen, N. J., on a 15-per-cent grade, came a sausage-like 80' x 250' vinyl-coated bubble that could stand up even to his 75-mph snorts. Once the three blowers extended the skin to its fullest, held it there with a pressure of one-inch water gauge, workmen, trucks, bulldozers, etc., streamed into it and onto the site that was to hold a 131-unit, 5-story motel. The envelope can be heated for winter use, illuminated inside or from the outside, is vented to carry off objectional odors, fitted with revolving or conventional doors for personnel, equipped with flaps to accommodate chutes and ramps and vestibule airlocks for vehicles. The Hoosier Air Structure, Hoosier Tarpaulin & Canvas Goods Co., is built of nylon fabric supplied by Wellington Sears Company and coated by the Sawyer Coated Fabrics Division of Farrington Texol Corp. Zipped together in sections, it can be fabricated according to need, deflated and hauled away in a small truck. Its translucence admits ample light while turning away weather. Here, in dead of winter, it surrounds the 5-story, 131-room Purama Motel.



A complete set of Sears, Roebuck & Co.'s general catalogs—every one since 1892—on more than a mile of microfilm will be included in the Sears Library of Free Enterprise at the American Freedom Center, Valley Forge, Pa. Here Admiral Felix Stump, USN (Ret), vice-chairman and chief executive officer, Freedoms Foundation (left), and James M. Arnold, president of Recordak Corp., look over the 61 cartons containing the microfilmed catalogs.

porter analyze the adjustments he will have to consider in deciding to enter a field of activity, leading him through the fine points of staffing, financing, cost control, and similar items. Should the small business owner decide to enter foreign trade, the Department of Commerce takes over to tutor him in the technical and export problems involved.

**Hosiery Learner Regulations Amended.** The Administrator of the U.S. Labor Department's Wage and Hour and Public Contracts Divisions has effected (September 3) pay raises and changes in the learning periods for learners in the hosiery industry. Learners in the seamless branch now will draw minimums of $1.00 and $1.07½; in the full-fashioned, $1.05 and $1.12½. All learner occupations remain, but pairing and mending learning periods are reduced to 720 hours; folding women's full-fashioned and seamless nylon and rayon, to 360; and boarding women's full-fashioned raised to 360 hours. A new learner category, sewing or seaming elastic bands on tights, tops of stockings, etc., is added at 240 hours.

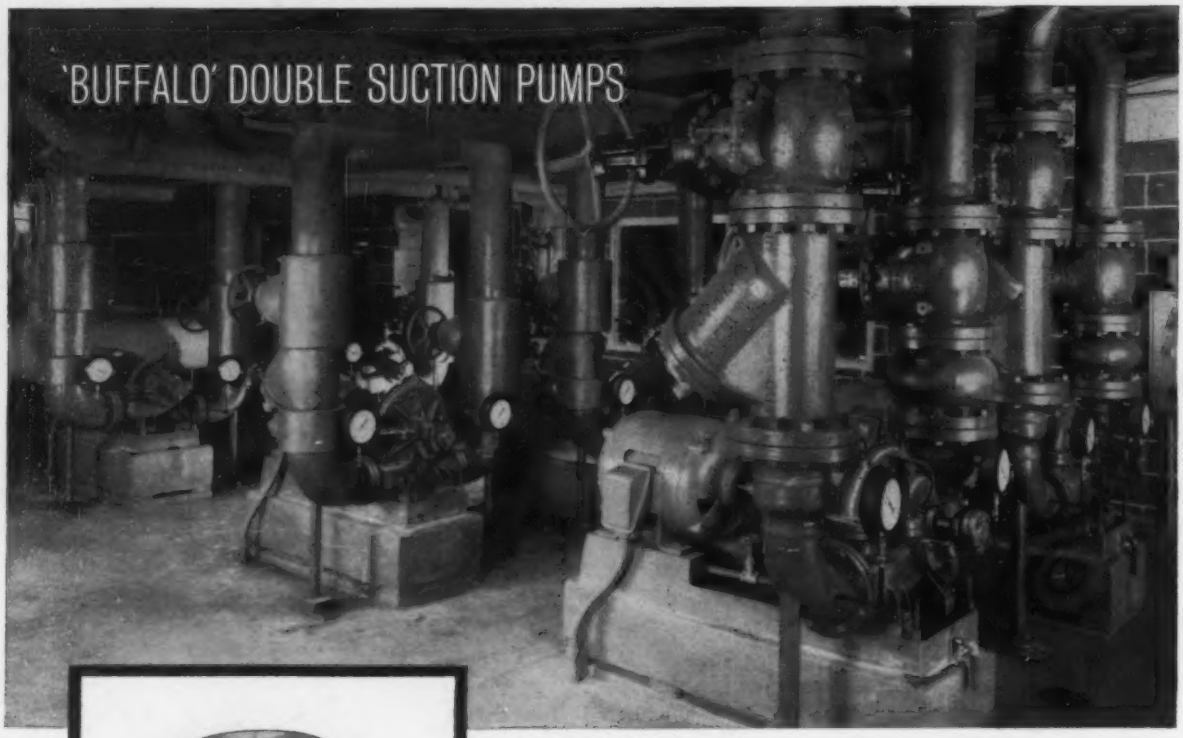
**Night Degree at PCTS.** Evening-school students at Philadelphia College of Textiles and Science will be able to work toward a B. S. degree, starting this month. The school is offering the degree in three fields: Business Administration, Chemistry, and Textile Management and Marketing. Entrance requirements will be the same as for the day school, and the average student is expected to be able to complete his program in seven years.

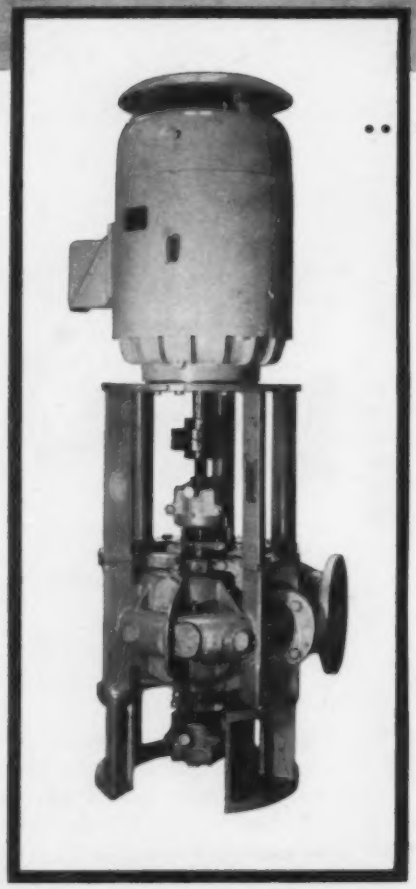
**AATCC Parley Scheduled.** The Piedmont Section of the American Association of Textile Chemists and Colorists will sponsor its first Southern Textile Research Conference October 19 and 20 at William Hilton Inn, Hilton Head, S. C. The agenda includes a panel discussion on "Problem Solving Through the Use of Fundamentals," and topics by Dr. Emory Valko, Dr. Henry E. Millson, Dr. E. M. Hicks, Jr., and Dr. Burt A. Faris. Applications (attendance is limited to 50) may be obtained from Dr. Luther B. Arnold, Jr., P.O. Box 277, Elon College, N. C.

**U.S.S.R. Journal Translated.** The Textile Institute, 10 Blackfriars St., Manchester 3, England, offers cover-to-cover English translations of the Soviet Union's leading textile journal, *Technology of the Textile Industry*. The bimonthly journal contains articles and reports on the results of scientific research carried out in the Soviet higher educational institutions, together with advanced foreign and Soviet experience pointing the way to further research into textile technology.

**Sock Award.** Retail stores which take "constructive action through more effective marketing techniques to increase the sale of socks and anklets and to benefit the industry as a whole" will be rewarded this year for their efforts by Durene Association of America. Ten awards will be made; each

*Continued on page 33*



## ....it's the quality that makes them dependable

In the range of general water service from 10 gpm to 14,000 gpm, 'Buffalo' Double Suction Pumps have *earned* a worldwide reputation for dependability. They're the kind of pumps that go about their work quietly, efficiently, practically unnoticed... service is *that* reliable, repairs and maintenance *that* infrequent.

Over 200 single-stage models (horizontal and vertical) are available. Some for handling water to 300° F. Others to deliver against 500' heads. Still others that are fully approved by the National Board of Fire Underwriters. Each features the most rugged and reliable construction obtainable today.

Designed to remain in hydraulic balance under all conditions of head and pressure, each model is available with clockwise or counterclockwise rotation... motor, turbine, V-belt, or gasoline engine drive. Standardized parts are interchangeable... horizontally split casings permit pump inspection or repair without disconnecting piping. Shafts and impellers can be furnished in a variety of metals.

The Buffalo representative nearest you is the leading pump authority in your area. Give him a call or write Buffalo Forge direct.

"Buffalo" PUMPS

**BUFFALO PUMPS DIVISION**

BUFFALO FORGE COMPANY • Buffalo, New York

CANADA PUMPS LTD., KITCHENER, ONTARIO

*'Buffalo' Air Handling Equipment to move, heat, cool, dehumidify and clean air and other gases.*

*'Buffalo' Machine Tools to drill, punch, shear, bend, slit, notch and cope for production or plant maintenance.*

*'Buffalo' Centrifugal Pumps to handle most liquids and slurries under a variety of conditions.*

*Squier Machinery to process sugar cane, coffee and rice. Special processing machinery for chemicals.*



**For further information use Handy Return Card, Page 201**

# RECENT TECHNICAL AND COMMERCIAL DEVELOPMENTS

by J. B. Goldberg
*Consultant to the Textile and Allied Industries*

**Exclusive**

## FIBERS AND YARNS

**Curly Glass Fibers.** A British patent has been assigned to Owens-Corning Fiberglas Corp. on a process for the manufacture of curly glass fibers by the spinning of two or more glasses that differ in coefficient of thermal expansion under conditions that cause the two streams to unite in the spinner.

**Kinked Carpet Yarn.** A southern mill has patented a process for the production of a kinked yarn comprising twisting a synthetic carpet yarn, skeining, shaking the skeins in an oscillating fashion to facilitate relaxation and kinking of the yarn, heat setting in a relaxed and kinked state, stretching, then winding onto bobbins.

**Broom Tree Fiber.** Two Australians have developed a patented process for obtaining a high-quality fiber from the Genistra (broom tree) plant. The skin from the slim branches of the plant are processed with chemicals to yield a polished, linen-like fiber which is said to be strong, readily dyeable, and non-shrinking in water. Suggested uses are for types of linen fabrics as well as for rope and string.

**Japanese Synthetic Fiber.** A new polyazine fiber has been developed in the laboratories of the National Research Institute at Yokohama, Japan. Still in the laboratory stage, this fiber is claimed to have properties substantially closer to natural fibers than other man-made fibers.

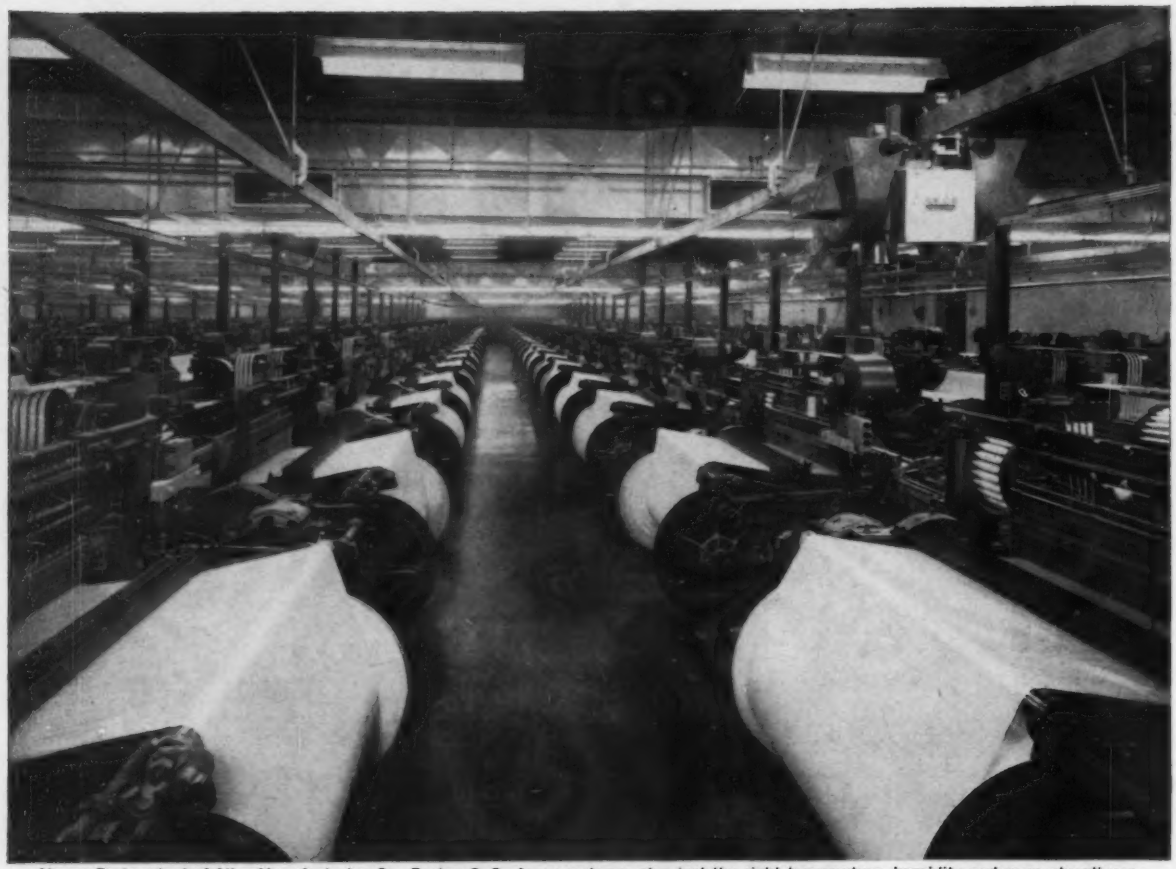
**Rayon Fibers or Yarns for Blending with Cottons.** A Dutch rayon producer has received a British patent on viscose spinning bath composition to produce filaments and fibers with the same stress-strain characteristics as cotton.

**Nylon 501 Dyes Differently.** Differential dyeing of carpets made of type 501 continuous filament nylon is made possible with a new form of the fiber now being produced by Du Pont in limited quantities. The new 501 nylon is

*Continued on page 33*

Italy's Montecatini Co. has announced development of a high-resilience Meraklon polypropylene fiber for carpets, in 15- and 25-denier sizes. Crease recovery is claimed to be the same as that of the average carpet wool. Conventional polypropylene staple has a recovery much less than this value; nylon is slightly less resilient than wool. The new Meraklon is 85c/lb in natural color and 95c/lb in spun-dyed colors.

Shredded wire undertread is now being used by Goodyear Tire & Rubber Co. in tires for off-the-road equipment. The wire is claimed to resist cuts and to curb growth of any cuts that do occur. Wire is 0.0058" diameter, and a 33.5-33 tire uses about nineteen pounds.



At new Foster plant of Alice Manufacturing Co., Easley, S. C., Amco systems give just the right temperature, humidity and room cleanliness.

# Amco systems control temperature, humidity, room cleanliness at ALICE Manufacturing Company

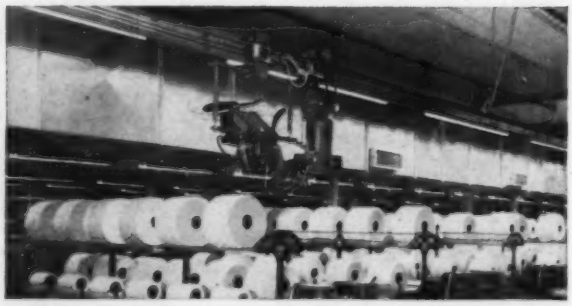
Alice Manufacturing Company is noted for its fine print cloth. One big reason for its success: rigid quality control.

Exact temperature, humidity and room cleanliness control is a must in this manufacturer's quality control set-up. That's why Amco Central Station Air Conditioning, Amco Ceiling Cleaners and Amco Heliclone® Loom Cleaners are on the job!

### AMCO AIDS OUTPUT, CUTS WASTE

Here's how Amco-controlled temperature, humidity and room cleanliness help improve quality and boost production. They keep materials in top condition during each processing step to assure stronger, smoother, more uniform fabric. They permit closer machine adjustments, higher machine speeds. They reduce broken fibers, dust, fly . . . greatly decrease the need for cleaning . . . eliminate troublesome static electricity.

You can always rely on Amco to give you dependable advice and expert installation best suited to your needs. Why not learn how Amco can help *your* mill? Contact your nearest Amco representative today.



Combing department at Alice Manufacturing Co. relies on Amco Central Station Air Conditioning and Amco Ceiling Cleaner. Consulting engineers: Campbell and Leppard.

AMCO

Since 1888

**Air Conditioning Equipment — Textile Specialties**

American Moistening Company, Cleveland, North Carolina
Branches: Atlanta, Ga., Providence, R. I., Toronto, Ont.



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# EXECUTIVE VIEWS

*Prepared by a man who is closely identified with the textile industry.*

# more inflation in the offing

MANY SIGNS point to another rash of inflation before long. While the National Administration has pledged itself to protect the integrity of the dollar, many of the things it is doing will undermine the dollar. For a number of years we have been pouring billions of dollars into a great variety of foreign rat holes. It is very difficult to guess how much good these expenditures have done.

Certainly, although a great deal of the money was wasted and much of it probably stolen, our help to Europe in the grim days after the last war did a great deal to help those countries get back on their feet, but most of those nations were already industrialized and had responsible governments so that our help could, in large part, go where it would do some good.

On the other hand, vast sums have been poured into the pockets of greedy politicians and grasping business men in countries where there was little to do with money except waste or steal it. It is now proposed to just about double the amount of our foreign aid on the theory that if we don't handsomely contribute to the welfare of most of the world, the Communists will *promise* to do something and walk off with the allegiance of a lot of countries disgusted with our parsimony and enchanted with the generosity of the "promising" Communists.

The Federal Government is undertaking to subsidize education, and aside from the various objections to having the government dictate the methods to be employed in running public schools all over the United States, there is a heavy price tag on what the government proposes to do. With the confirmed spenders, the question of how much good is going to be done, or how necessary it is to do something, is secondary. The large view holds that the more functions the federal government takes over, the better. We are now living, and have been living for some time, under a labor socialist government, regardless of what we call it, and the trend is constantly to more socialism rather than less.

There is also a very powerful movement toward a socialized medicine plan. Nobody knows how much this will cost, but it can cost just as much as we want it to, and the confirmed spenders always want things to be expensive. Along with this scheme for socialized medicine, there is an expensive package covering bigger pensions for the aged, whether the old people need the money or not and whether they have relatives capable of supporting them.

ALL OF THESE extra expenditures the government proposes to undertake run into a tidy number of billions of dollars, and little has been said about increasing taxes to get the money. Instead, the Congress is being asked to increase the "temporary" debt limit about five billion dollars. We have had several of these "temporary" increases and all of them later acquired a look of extreme permanence.

Maybe we have tinkered with our economy and our fiscal system to the point where it *can't* run without inflation. About four years ago a recession resulted in a deficit of about 12 or 13 billions of dollars, and of course when we go ahead and spend the money anyhow, whether we have it or not, we create inflation. Very few people in the Congress ever have the courage to contend that we don't *have* to spend a great deal of the money which is spent. A determination on the part of our government to get its money's worth wherever it spends money would almost certainly permit a big tax reduction.

The Administration is now seri-

# He's using a tougher yarn . . . why aren't you?

It takes a tough yarn to stand up in a racing car tire... and tough is the word for high-tenacity Golden Caprolan® nylon by Allied Chemical. But Golden Caprolan is more than just tough. It is a remarkably versatile yarn that offers a unique combination of superior performance qualities. Unsurpassed resistance to abrasion, excellent rubber adhesion, greater resistance to flex-fatigue, excellent troughing qualities, to name a few. Golden Caprolan established a new criterion for heat stability in nylon tire cord and a new standard of strength for marine cordage. Golden Caprolan is also performing superbly in conveyor belts, industrial webbings, tarpaulin fabrics and many other applications where heavy-duty performance is essential. If you have a tough job, we have the tough yarn for it. Our technical service staffs are ready to help you.

Allied Chemical

Fiber Marketing Dept., 261 Madison Ave., New York 16, N. Y.

GOLDEN *caprolan*
NYLON FOR THE 60's



*For further information use Handy Return Card, Page 201*

ously urging upon the taxpayers the support of a project to land a man on the moon at the bargain rate of some 40 billion dollars. Just what tangible return the said taxpayers can expect from this outlay has apparently never even been considered. The Russians are talking about landing a man on the moon, so of course we have to try to put one there. The cost of the enterprise, or its value, seems to make no difference. We must keep up with the Russians, or if possible get ahead of them, in some of these propaganda stunts as well as in the tangible and admittedly worthwhile advances of Russian science.

A FEW WEEKS AGO somebody dug up the news that our principal missile base at Cape Canaveral was being operated on the Roman Holiday principle. It seems that common laborers were getting around $275 a week and electricians and other moderately skilled workmen were getting up to $750 a week. Regardless of the performance of the space vehicles, Cape Canaveral was certainly putting the taxpayer in orbit.

These fantastic wages were extorted from the taxpayers by the simple expedient of slow-downs by the workmen so that little was accomplished and it became necessary to put in a lot of overtime to try to accomplish it. When a man puts in more than a certain amount of overtime he is very likely to sleep off a good bit of it, and in a well organized union racket, the contractors are not supposed to fuss about people getting double time or so, but only doing half a day's work or less. After all it is the taxpayers' money, and the contractors and the labor racketeers might as well have it as anybody else.

Unhappily, there is nothing particularly unusual about this Cape Canaveral situation. It is inherent in labor unionism. The unions completely control the rate at which work is done and the general regulations applying to the doing of the work. The employer has very little to say about the matter, and if he says it, he can have a strike on his hands. Since the unions exercise absolute mo-

# FUTURE EVENTS

| Date | Event | Location |
|---|---|---|
| Oct. 5-6 | North Carolina Textile Manufacturers Association, Inc., annual meeting | Carolina Hotel Pinehurst, N. C. |
| 5-6 | Textile Quality Control Association | Sedgefield Inn Greensboro, N. C. |
| 5-6 | A.I.E.E. Conference on Electrical Applications for the Textile Industry | Barringer Hotel Charlotte, N. C. |
| 7 | Northern Piedmont Section AATCC | Hotel Roanoke Roanoke, Va. |
| 7 | Alabama Textile Operating Executives carding and spinning discussion—9:30 a.m. | Thach Auditorium Auburn, Ala. |
| 7-8 | Pacific Southwest Section AATCC annual outing | Rancho Sante Fe, Cal. |
| 11-13 | Quartermaster Association national convention | Biltmore Hotel Atlanta, Ga. |
| 11-21 | International Knitting Machinery & Accessories Exhibition | Belle Vue Hall Manchester, England |
| 11-13 | Fiber Society | West Point, N. Y. |
| 12-14 | Symposium on Permanent Finishing, sponsored by Swiss Association of Textile Chemists & Colorists | Zurich, Switzerland |
| 13-21 | North Carolina Trade Fair | Coliseum & Merchandise Mart Charlotte, N. C. |
| 14 | Textile Operating Executives of Georgia slashing and weaving discussion | Ga. Tech Atlanta, Ga. |
| 14 | South Carolina Div. STA | Clemson, S. C. |
| 16-20 | National Safety Congress | Hotel Hilton Chicago, Ill. |
| 19-20 | Southern Textile Research Conference | William Hilton Inn Hilton Head Island, S. C. |
| 20 | Northern New England Section AATCC | QM R & E Command Natick, Mass. |
| 21 | Northern North Carolina-Virginia Division STA | Cooleemee, N. C. |
| 25 | Tufted Textile Manufacturers Association workshop | Hotel Patten Chattanooga, Tenn. |
| 27 | Delaware Valley Section AATCC | Beck's Restaurant Philadelphia, Pa. |
| 28 | Eastern Carolina Div. STA | N. C. State College Raleigh, N. C. |
| Nov. 1-2 | Textile Engineering Div. ASME | MIT Cambridge, Mass. |
| 1-3 | Industrial Engineering & Management Clinic, sponsored by Industrial Management Society | Pick-Congress Hotel Chicago, Ill. |
| 8-9 | Chemical Finishing Conference | Sheraton Park Hotel Washington, D. C. |
| 9 | Piedmont Division STA | Johnston YMCA Charlotte, N. C. |
| 13-15 | Narrow Fabrics Institute | Statler Hilton New York City |
| 18 | Midwest Section AATCC | Chicago, Ill. |
| 25 | Southeastern Section AATCC | Atlanta Athletic Club Atlanta, Ga. |
| **1962** | | |
| Mar. 29-31 | American Cotton Manufacturers Institute annual meeting | Biltmore Hotel Palm Beach, Fla. |
| Apr. 25-28 | National Association of Hosiery Manufacturers annual convention | Americana Hotel Bal Harbour, Fla. |
| Sept. 5-7 | Canadian Textile Seminar | Queens University Kingston, Ont. Canada |
| Oct. 15-19 | Southern Textile Exposition | Textile Hall Greenville, S. C. |

# RELIANCE V★S SLASHER DRIVES PUT 25% MORE YARN ON THE BEAM

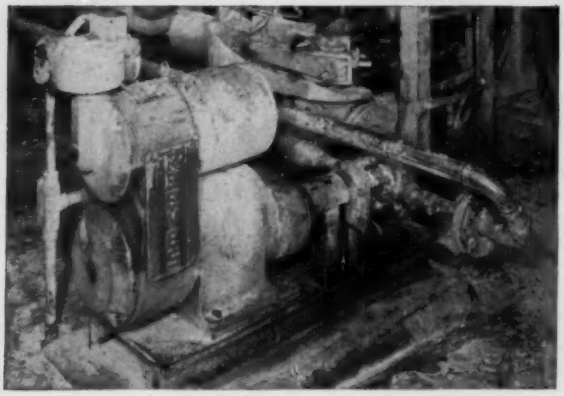
The answer is in precise tension control . . . always uniform from empty to full beam. The result: more yarn on each beam, and fewer beams to tie in. A leading textile mill finds that it can put 25% more fine count cottons on the beam with its Reliance-powered Slasher.

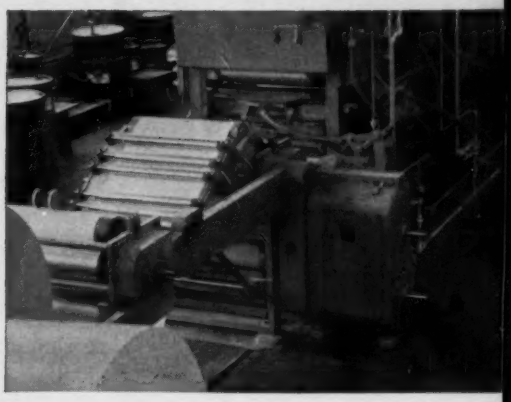
Tension precision extends to a wide range of fabrics . . . and in a wide range of speeds. Reliance V★S Drives maintain this tension during acceleration and deceleration.

Reliance Super 'T' V★S Drives now give you more horsepower in 35% less space, opening up additional usable work areas.

Let your Reliance Sales Engineer tell you about Total Service . . . the coordination of Application Engineering, Start-Up Assistance and Service—to give you complete attention from engineering to maintenance and renewal parts. Check your telephone Yellow Pages, or write or call us direct. A-1688

# RELIANCE...builders of the tools of automation





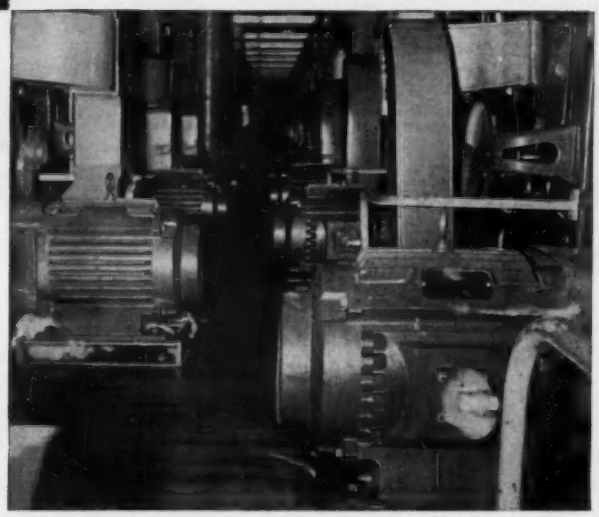
**REEVES MOTODRIVE,** operating this clay pump in a paper mill, demonstrates its ability to perform under rugged environmental conditions. Use of these mechanical variable speed drives is both economical and practical; they are readily adaptable to remote, manual or automatic process control (Airtrol). Horsepower ratings ¼ to 40; speed variation ranges from 2:1 to 10:1. The many thousands of space-saving assemblies (actually 49,920) mean that practically any application can be made without modification of the standard unit. Catalog G-100.

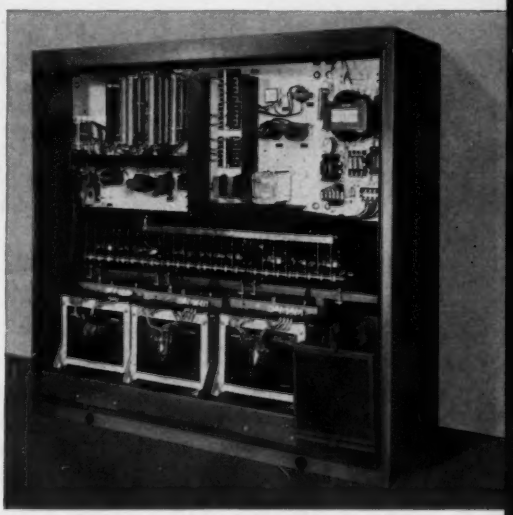
**REEVES TRANSMISSIONS** make possible a low-cost means of preserving constant tension on this rotogravure press. You can adjust speeds from any pick-off point of a line shaft either manually or automatically. On Reeves Transmissions, either shaft can be connected to the source of power and used as the constant speed shaft, with the other shaft driven at variable speeds. Drive connections can be any way you want them . . . belt and pulley, chain and sprocket, pinion and gear, multiple V-belt and sheaves, or direct. Bulletin T-497-3.

---

**RELIANCE LINT-PROOF MOTOR.** Completely eliminates motor cleaning and motor repairs resulting from lint accumulations. Greatly reduces all motor maintenance by providing a self-contained, completely enclosed unit which requires only infrequent lubrication. This motor is designed for conventional mountings—saves space through under-frame mounting and driving through the fan cover. Now available in 1 through 30 hp. for application on spinning, roving, drawing and twisting frames, as well as on cards, openers, pickers and other textile machines. Bulletin B-2404.

**RELIANCE V★S STATATRON** is a static-powered drive for wide range variable speed from in-plant a-c. circuits, available from 1 to 200 hp. Instead of a motor-generator set, the Statatron uses silicon diodes and saturable reactors to rectify the current from a-c. to d-c. These work in combination with a transistorized power exciter to supply variable voltage. Statatron is compact—smaller than conventional units. Consists of only three components: Super "T" D-c. Motor, operator's station and control cabinet. Statatron is quiet—vibrationless, and low in maintenance cost. Bulletin D-2508.





**RELIANCE** ELECTRIC AND ENGINEERING CO. ●

DEPT. 20-10, CLEVELAND 17, OHIO ● Canadian Division: Toronto, Ont.

23-1-37

# Is S-T-R-E-T-C-H your problem?

■ Put more than seven years' experience in fabric design and construction at your fingertips by talking with Leesona. ■ This experience started when Leesona introduced the original single process stretch yarn machines in 1954. It has grown through the years, thanks to extensive research and development in proper yarn processing conditions, fabric construction and methods of weaving and finishing fabrics. ■ Today, America's leading throwsters are keeping pace with this dynamic market development by producing stretch yarns of superior quality on the Leesona #553 stretch yarn machine. ■ Leesona's Technical Service Department is ready to assist America's producers in weaving better, higher quality stretch fabrics more economically. You are invited to contact them. ■ Leesona Corporation, P.O. Box 6088, Providence 4, Rhode Island.

LEESONA

**Leesona Leads to Better Fabrics**

nopoly control over practically all jobs in unionized activities, the employer has little to say about what he does except to do it after being told what is expected by the union. When an inconsequential matter like taxpayers' money is involved, everybody seems to have his hand out.

THE SUPREME COURT has just handed down a decision in which two Justices stated, "Responsive to the actualities of our industrial society, in which unions as such play the role that they do, the law regards a union as a self-contained, legal personality exercising rights and subject to responsibilities wholly distinct from its individual members."

This seems to indicate that at least a part of our Supreme Court looks upon a labor union as a sort of sovereign state not responsible for its actions under laws that it disapproves, and possessing the right to do just about as it pleases regardless of who is harmed and to what extent.

IF THERE IS any one thing which would do the textile industry less good than another, it is more inflation. Our industry is already one of the major victims of the inflation we have, and a little more inflation may cripple it past recovery. The specter of foreign competition is constantly more menacing because this is something that grows naturally.

A few years ago a lot of our foreign imports were sporadic shipments taking advantage of favorable market conditions for highly stable goods. More and more foreign concerns which have been developing specialized markets in the United States are expanding those markets. The importers are developing more and more regular customers for foreign goods, and with cheaper prices and an acceptable quality there is no reason to think that the market for foreign goods will not continue to grow.

The more it grows, the more the countries exporting to us will have at stake, and the harder it will be for our national government to do anything about it for the protection of the American industry. Very little is being done now. Another fairly serious shot of inflation which will increase the prices of American textiles another 10 to 20 per cent would be a wonderful boon to foreign manufacturers who are anxious to expand their markets in the United States.

## News in brief *(from page 23)*

winning store will receive a bronze medallion, and the individual employee of each store who contributed the most to the winning idea will receive a $1,000 vacation.

**Promote Seat Belts.** American Seat Belt Council has been formed as an auxiliary organization of the Narrow Fabrics Institute, and will develop a program of voluntary self-regulation to insure that belts offered for sale to the public meet minimum recommended standards. The new association will take over the activities of the Automobile Safety Belt Institute.

**"Gym Inflated, Sir."** The Goodyear Tire & Rubber Co. recently supplied the U.S. Navy an inflatable gymnasium for the *USS Theodore Roosevelt*, a nuclear sub carrying Polaris missiles. Built to

fit the 4′ x 22′ torpedo room passageway, the only available space on the ship, it can be set up by two men in 30 minutes, holds a punching bag, rowing machine, weights, etc.

**Beauty-Aid Hosiery Seized.** Food and Drug Administration didn't approve of a hosiery manufacturer's claim that his product was " . . . bathed in precious lotions that beautify your legs," so FDA agents recently seized nearly 2,000 pairs of the product on charges that they were mislabeled by the firm.

## Technical developments *(from page 25)*

claimed to take a differential shade in a complementary color when dyed in the same bath with regular 501 nylon.

### MACHINERY AND PROCESSES

**Control to Prevent Overdrying in Slashing.** A device to measure and control moisture by electrical conductivity utilizes electrodes mounted near the end of the slasher across the warp to detect residual moisture and relay deviations to a control panel. The control can also be used on tenter frames or dryers.

**Shuttleless Looms.** Based on the rapier principle and using a system of rods and a gripper device to take the yarn half-way across the width of the goods from each edge, a French shuttleless loom has been developed for pick-and-pick work. The raw edges are said to be trimmed at the loom.

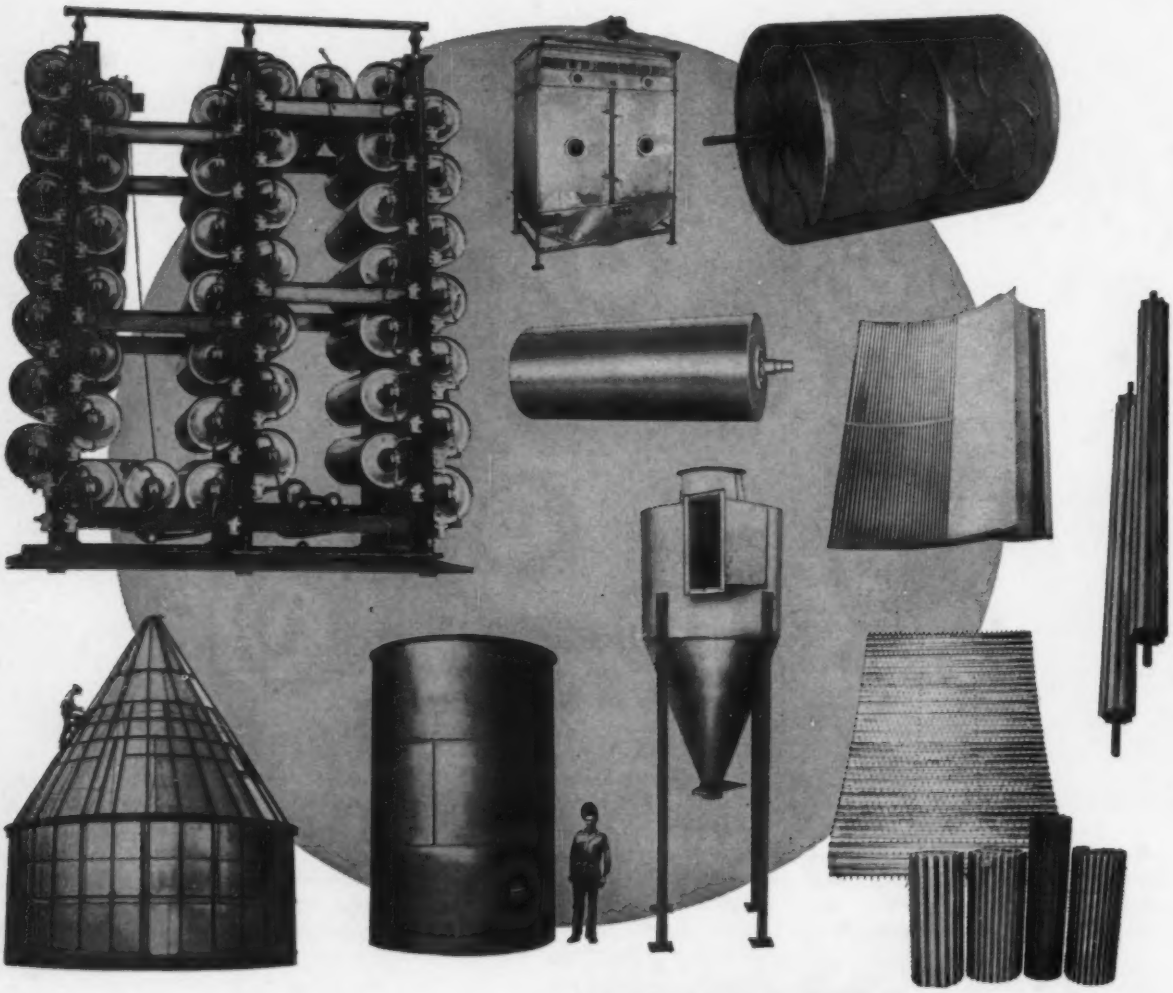
**Traveler Eliminated.** A Japanese textile mill has demonstrated a model spinning frame on which the conventional ring and traveler are replaced by two rings—an outer magnetic ring, and an inner polished "floating" ring. [Editor's Note: Systems of concentric rings to replace the usual ring and traveler have been tried before, for instance in Blackwood's U.S. Patent 2,550,761, issued in 1951. Nor are revolving rings novel—a worsted frame introduced in the late '40's had them. And Sonoco Products was the assignee of a patent about 10 years ago for a spinning system using a magnetized spindle and a nonmagnetic ring.]

# "Custom tailors" to industry

Since 1926, Sims has been designing and fabricating the specialized equipment called for in the manufacture of textiles.

As "custom tailors" of stainless steel, Sims' recommendations, designs, and fabrications are dictated by your particular problem, need, requirement or application of equipment. And, Sims specialists are on the job from start to finish to assure meticulous attention to even the smallest detail... the craftsmanship that unconditionally guarantees that the finished product will meet and surpass your most exacting specifications.

**rolls · vessels · kettles · coils · size boxes · linings · cylinders · machinery · air and material handling systems . . . for textile · chemical · food processing · pulp-paper and other industries**



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Harley D. Hohm, Inc., 128 Buist Ave., Greenville, S. C.
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METAL WORKS
WEST POINT, GEORGIA

Specialists in
Stainless Steel Fabrication



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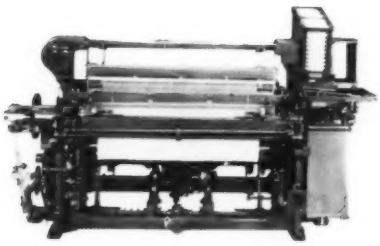

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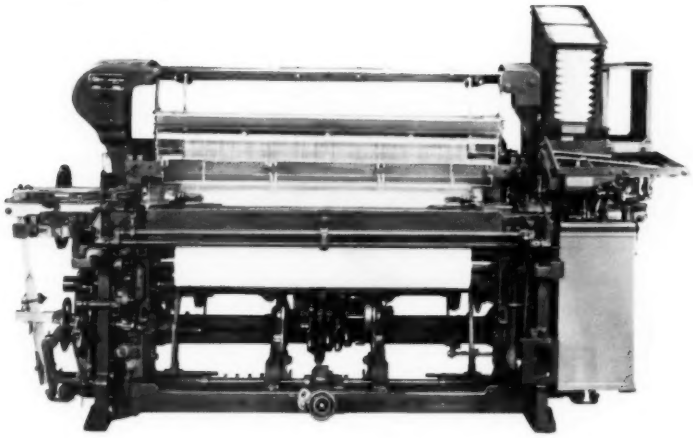

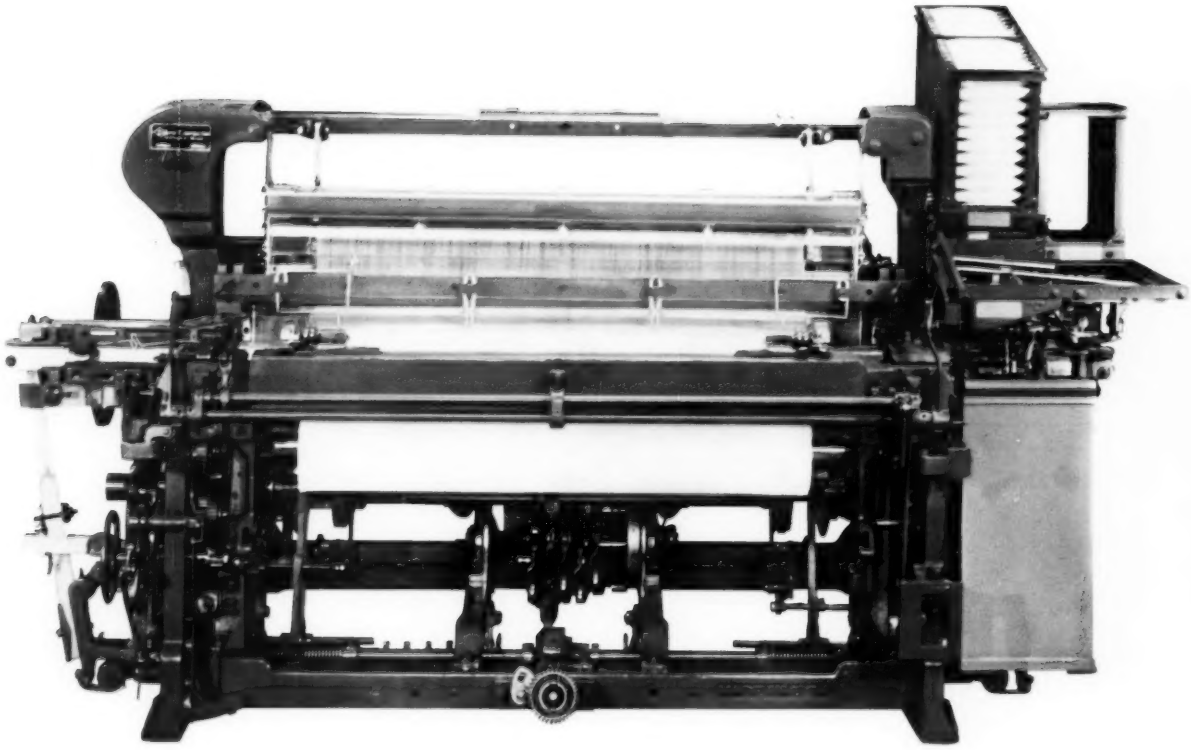

*Increased productivity and versatility equal more profit.*

**DRAPER CORPORATION**

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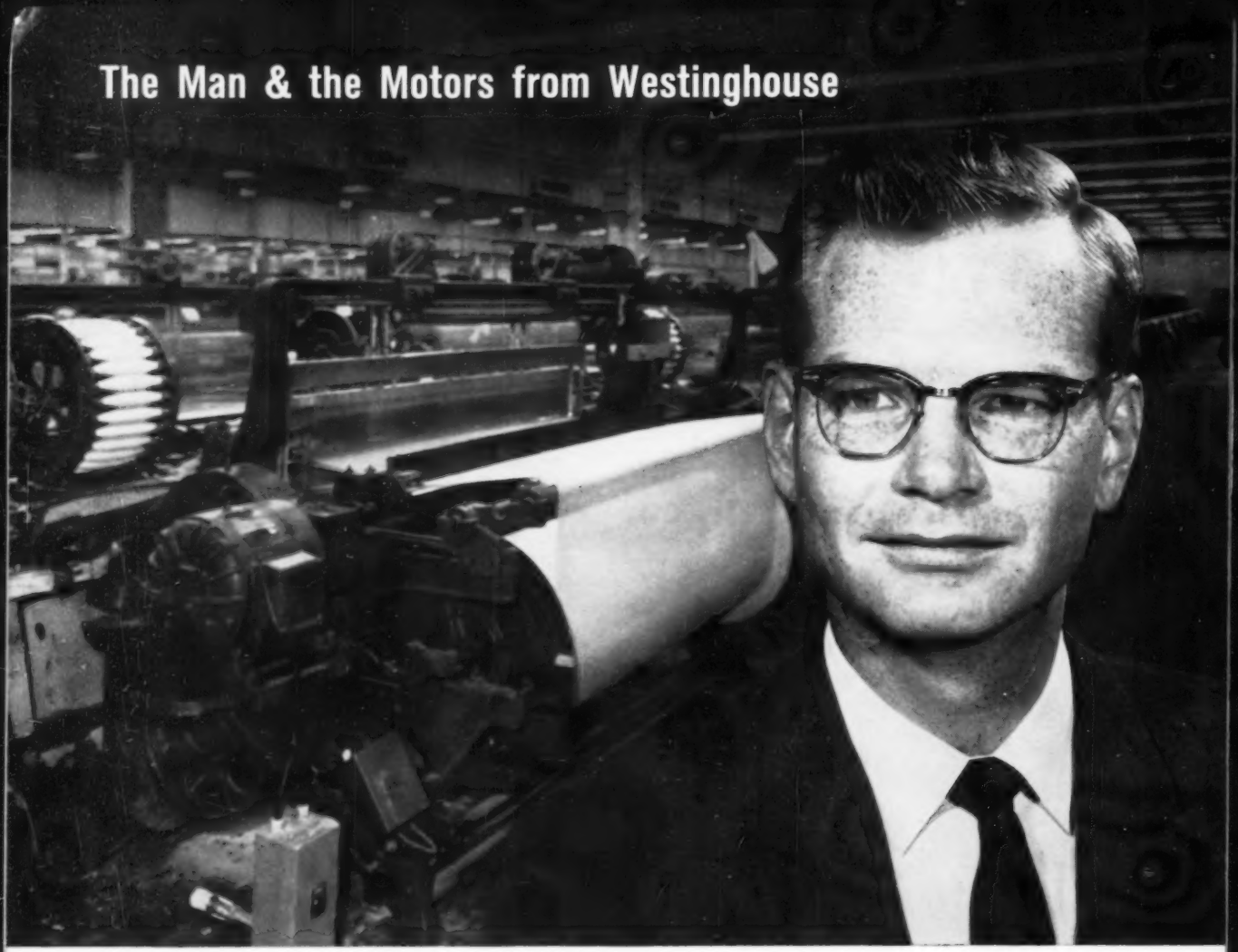
## The Man & the Motors from Westinghouse



# Mr. Westinghouse* and 160 clutch brake loom motors bang shuttles across 50-inch print cloth looms at 65 mph . . . no failures in 599,000 hours

How to drive a shuttle across a 50-inch loom a mile a minute—instant start and stop, 3 times a second—24 hours a day. One of the industry's largest print cloth producers has put 160 Westinghouse units through this motor-murdering duty a total of over a half million operating hours. No failures. High-speed, never-ending vibration, tremendous torque, and still Westinghouse tough, simply designed drives have cut maintenance 66% compared to other motors. "We operate 1830 looms in this plant and, under present plans, we will probably replace the older drives (when it is economically sound to do so) with Westinghouse motors," says the mill president.

Call in The Man from Westinghouse for all your electrical drive or related control requirements. With his experience in the textile industry, backed by the industry's best motor research and development facilities, he'll show you how to save money . . . whether it's a shelf item or a custom-engineered job. For additional information write: Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pennsylvania. *You can be sure . . . if it's Westinghouse.*

J-22168

*D. M. Lambert, Asheville, North Carolina, office.

**Westinghouse**

# Here where steel touches steel, Marathon Rings meet the challenge

Here, where surface finish is critical, where the traveler continually contacts the ring, Saco-Lowell **Marathon Rings** bring you a special, more effective answer. Delivering fine performance at low cost, these soundly-engineered rings give top dollar value.

The ring that's hard enough to resist wear has traditionally presented starting-up problems. Softer rings, or rings with a softer "shell," solve one problem but introduce others. High polish has drawbacks, too. The trapping of abrasive impurities, or "dross," is one. Another is the actual increase in coefficient of friction that results, strange as it may seem, from extreme smoothness.

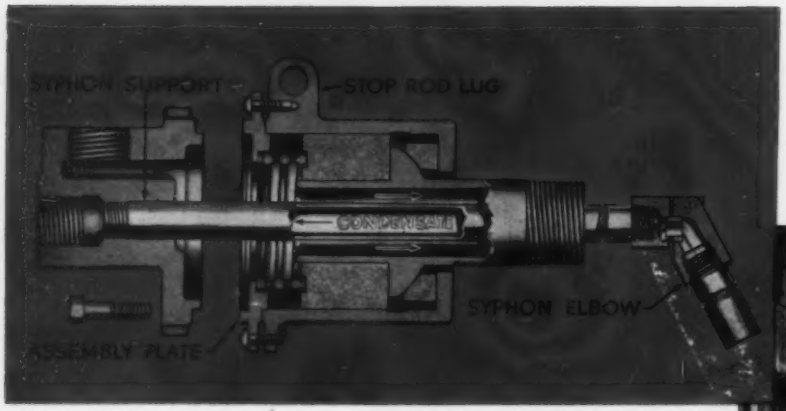
What is Marathon's better answer? Hard steel with a matte-finish surface produced by a revolutionary specialized process involving no dross. Smooth enough to shorten break-in time, not enough to create resistance to the traveler. No need for a soft steel casing. And priced surprisingly low.

True, Marathon Rings don't glisten like the more expensive rings you may be using now. That's because they're made for just one purpose: to do a good, steady job in the most economical manner possible. Get in touch with your nearest Saco-Lowell representative soon. See the difference Marathon Rings can make. Like all Saco-Lowell products, they're **built for better performance... backed by better service!**

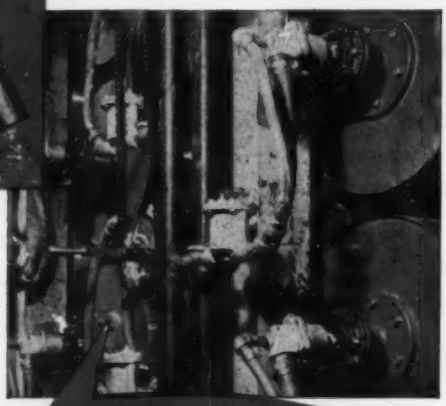
**SACO-LOWELL SHOPS**

**REPLACEMENT PARTS DIVISION**

EXECUTIVE OFFICES: DRAWER 2327, GREENVILLE, S. C.
SALES OFFICES: ATLANTA, GA.—805 PEACHTREE ST., N. E.
GREENVILLE, S. C.—P. O. Box 1698; CHARLOTTE, N. C.—P. O. Box 149;
GREENSBORO, N. C.—601 N. Elm St. Bldg.; SACO, MAINE—P. O. Box 230




**TYPE S-B2P** Johnson Joint with Syphon Elbow. This is a completely self-supporting unit; the lug shown on body is for simple stop rod to keep joints from turning. Installation view shows these joints installed on dry cans.



*These are the ones to use...* { For 23" dia. Dry Cans and 30" dia. Slasher Cylinders

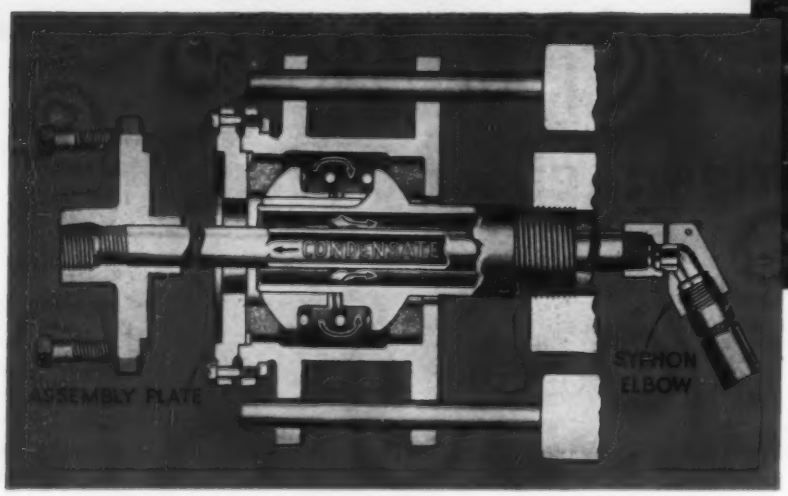
# JOHNSON *Rotary Pressure* JOINTS with JOHNSON SYPHON ELBOWS

These two types of Johnson Joints have proved particularly suited for service on the newer 23" diameter Dry Cans and 30" diameter Slasher Cylinders. The Type S is completely self-supporting; the Type LJ is rod-supported from bosses provided by machinery manufacturers. Both types are completely packless, need no lubrication or adjustment.

Pictured with each joint is the Johnson Syphon Elbow, successor to the unwieldy curved syphon pipe. It hinges to pass right through the joint, seats of its own weight when in position, permits the use of two simple straight pipes for the syphon line. Special assembly plate is provided on joints so the head and syphon pipe can be removed without disassembling the joint.

*Here's our offer*—We will gladly furnish a pair of Johnson Joints for 90-day trial in your own mill, without cost or obligation to you. There are Johnson Joints for all operating conditions.

***Write for full information***




**TYPE L-J2P** Johnson Joint with Syphon Elbow. Has lugs on body for support rods, which carry all weight of body and connections, permit rotating assembly to "float" freely inside. Steam inlet is in side of body as shown in installation view of joints on slasher cylinders.

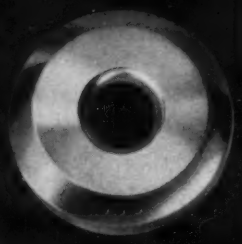
**THE JOHNSON CORPORATION**

**815 Wood Street, Three Rivers, Michigan**

Rotary Pressure Joints • Direct Operated Solenoid Valves



*For further information use Handy Return Card, Page 201*

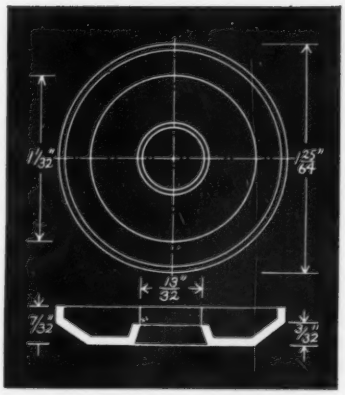


# MITCHELL-BISSELL

## *For Warping, Creeling, Winding*

Mitchell-Bissell Tension Discs are made of highest quality steel to exacting standards for dimensions, weights and flatness of contact surface. They are plated with dense hard chromium, in either mirror or satin finish, for constantly uniform tension and long wear. Small holes in each disc indicate pattern number. Standard dimensions, sizes and weights are shown at right. Posts are available in any required ceramic, and in any over-all length.

Prices for any quantity of the five standard patterns shown at right will be furnished promptly; or, if your requirements call for any special size, weight or material thickness, please send details for quotation.




| Mitchell-Bissell Pattern No. | Approx. Weight in Grains |
|---|---|
| 1 | 90 |
| 2 | 112 |
| 3 | 45 |
| 4 | 55 |
| 5 | 70 |

**These quality Tension Discs can be used with the same assurance of reliable service which has distinguished other Mitchell-Bissell products through the years. Samples gladly sent on request.**

EST. 1882

## MITCHELL-BISSELL CO.

### TRENTON, NEW JERSEY

*Southern Representative:* HOLT ASSOCIATES, INC., *Greensboro, N. C.*

*The Only Manufacturer Offering a Complete Line of All Types of Ceramic and Wire Guides for the Textile Industry.*

# HOW DU PONT PUTS YOU DOLLARS AHEAD IN MAINTENANCE PAINTING

Ben Warwick is a paint expert who specializes in the solution of maintenance problems for the textile industry. As a member of Du Pont's Technical Service Group, he has but one function: to help you cut the cost of maintaining your substantial investment in plant and equipment. As Ben sees it:

"To insure maximum return for every dollar spent on paints and painting, the only true measure of value is cost-per-square-foot-per-year. Take it from me, an additional paint dollar spent initially can save ten later on. When you specify Du Pont finishes, however, you're getting more than top-quality paints. You're getting sound paint practice, backed up by proven field performance.

"A case in point is our new IMRON(T.M.) Textile Floor Finish, a single package oil-free urethane clear for all interior wood and concrete floors. With this new finish, you can apply the first coat on an off-day morning, the second that afternoon and let full traffic back on it at midnight! In actual on-the-job tests, IMRON has delivered up to 3 times the durability of conventional first-grade floor seals.

"Naturally, our recommendations don't stop with selection of the proper finish. To effect the kind of savings that translate maintenance dollars into profit dollars, the right paint system is just as important. We work closely with your maintenance men, drawing on our own experience to provide expert guidance all along the line. The result: paint maintenance tailored to your particular needs, at lowest cost per square foot per year."

For more information on Du Pont's full line of quality finishes for every maintenance need, contact the Du Pont district sales office in your area. To receive Du Pont's technical bulletin, "IMRON Textile Floor Finish," clip and mail the coupon below. There is no obligation whatever.

**E. I. du Pont de Nemours & Co. (Inc.)**
Finishes Division, Department TI-110
Wilmington 98, Delaware

Please send me, without obligation, the Du Pont technical bulletin, "IMRON Textile Floor Finish."

Name _____

Firm _____

Street _____

City _____ Zone ____ State _____

## MAINTENANCE PAINTS

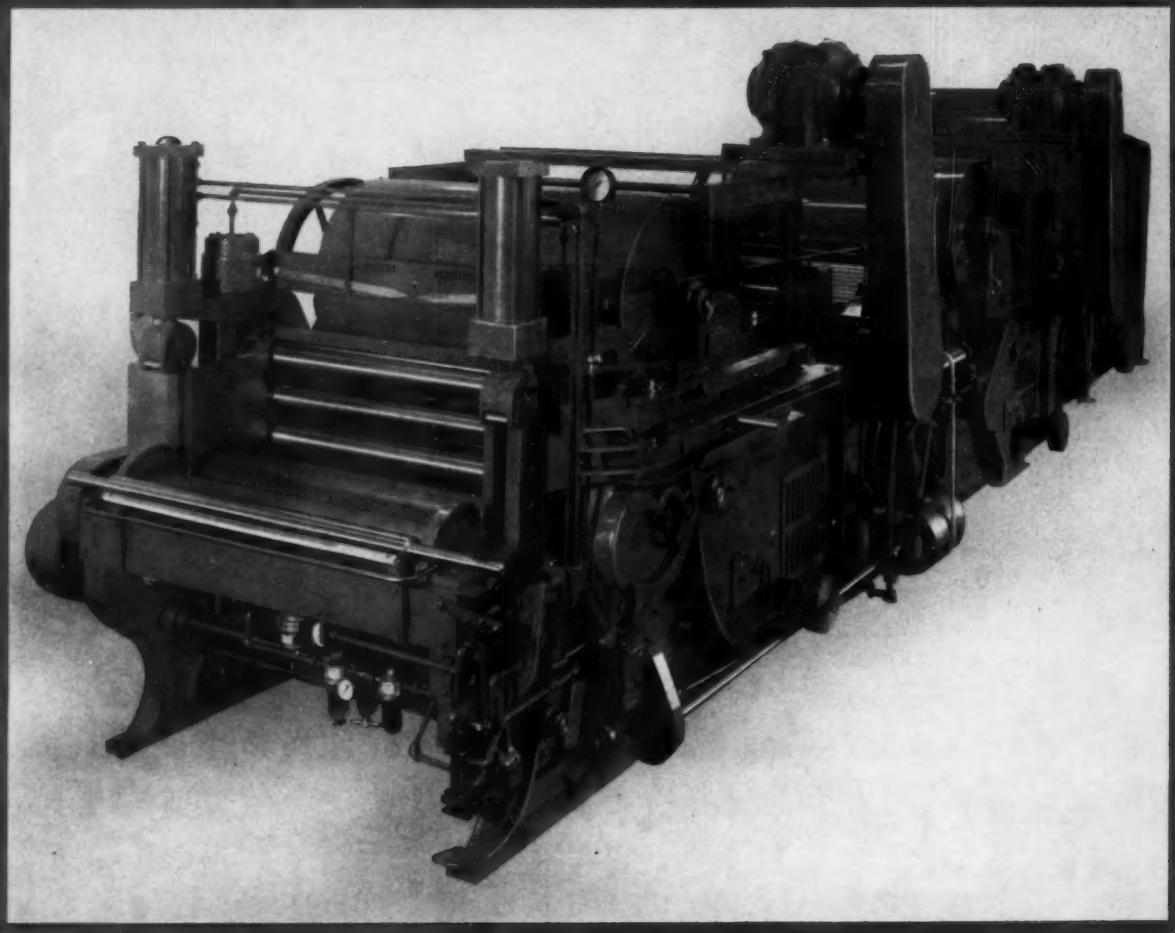
DU PONT

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*



*For further information use Handy Return Card, Page 201*

# The ALDRICH *Synchronized Single Process* *Picker...* with HIGH COMPRESSION CALENDER



This is a true Single Process Picker, in which the finisher section is fed with a smooth, well-formed lap from the breaker section, instead of with loose stock from a gauge box or hopper feeder.

Aldrich laps are more uniform, inch-by-inch, and will make more uniform card sliver.

**AldricH MachinE WorkS**

Greenwood, South Carolina

# Weaving Problems?

## SEND FOR A P&F TEXTILE SERVICE MAN!

The know-how of our textile experts goes far beyond the proper use of P&F starch products, and so do their suggestions. Each man on our technical service staff brought to his job outstanding technical skill and problem-solving ability—the basis of selection. Further experience as a Penick & Ford representative broadened and deepened his knowledge in the textile field. Behind him are the personnel and facilities of P&F's advanced research laboratory.

If you're interested in improving your operations—and who isn't—don't overlook this opportunity to get a fresh slant from a "pro." No strings attached.

Penick & Ford

**PENICK & FORD, LTD.**
INCORPORATED
1531 Marietta Blvd., Atlanta, Ga.

The P&F Textile Service Man tests yarns and fabrics for added weights, tensile and other properties

Checks out your warp sizing, finishing and glazing solutions under actual production conditions

Studies equipment and methods . . . uses his wide experience to help you attain top performance

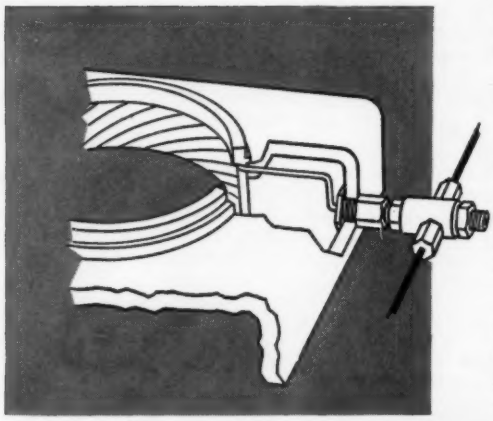
More than 500 varieties of starches and starch derivatives in these families: Penford Gums • Pensize Gums • Penford Finishing Gums • Essex Gums • Clearsol Gums • Douglas Pearl Starches • Douglas Modified Starches • Douglas Dextrines • Douglas Oxidized Starches



*For further information use Handy Return Card, Page 201*

# ALEMITE FULLY ADJUSTABLE RING LUBRICATION SYSTEM

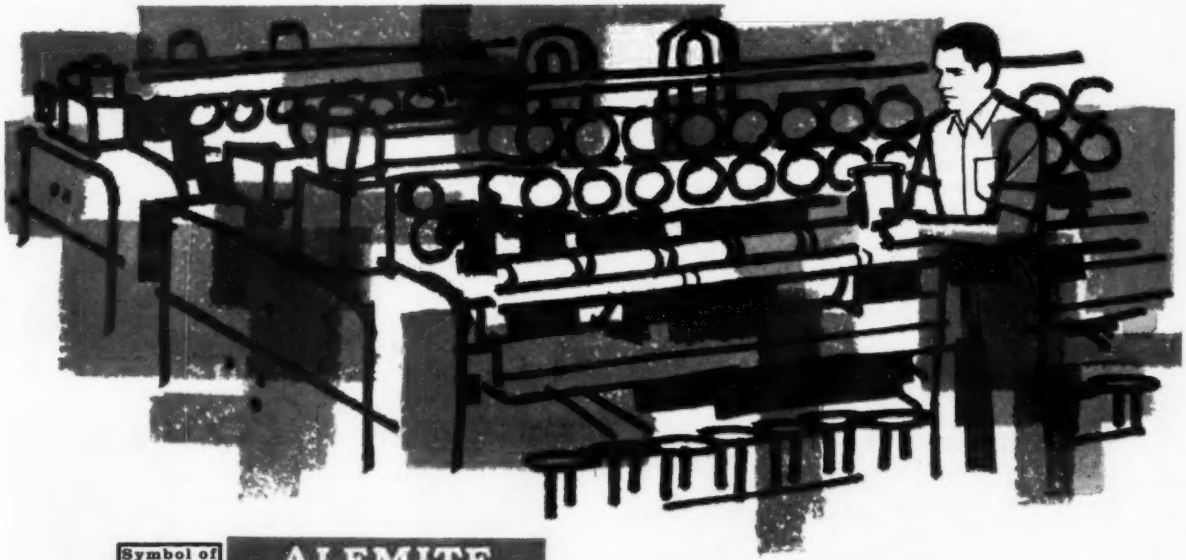
*less ends down*
*cuts product spoilage*
*equalizes tension*
*increases ring life*
*reduces horsepower*



This accurate, economical, low-pressure lubrication system increases production because it is fully automatic. Machines need never shut down to be lubricated. It maintains constant, positive lubrication—allows machines to run at higher speeds. Product spoilage is reduced because accurately dispensed amounts of lubricant are so minute, the traveler does not "throw" lubricant.

In addition, this Accumite system completely eliminates leakage between the ring and the frame . . . assuring neater, cleaner lubrication. It meters out positive amounts of lubricant to every ring on the frame rail to equalize tension, provide uniformity of thread—reduce lubricant consumption and prolong ring life. Accumite is adaptable to all lubricated rings.

Benefit from the many advantages by equipping your spinning and twister frames with an Alemite Accumite System. When ordering new frames specify Alemite. *Write today for additional information and free catalog #34-49.*

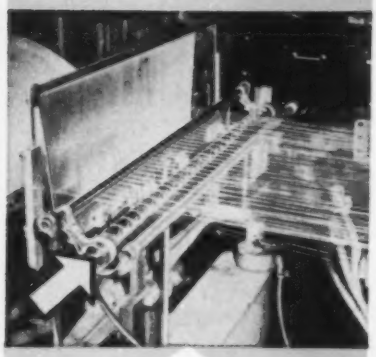


Symbol of SW Excellence

ALEMITE DIVISION
STEWART-WARNER CORPORATION

Dept. O-101, 1850 Diversey Parkway, Chicago 14, Illinois

In Canada: Stewart-Warner Corporation of Canada, Ltd.
Belleville, Ontario



# FOR STATIC-FREE WARP BEAMS

Hundreds of mills throughout the world are now enjoying static-free warper operation—at low cost. These are mills who have installed the fabulous Simco *"Midget"* electronic static eliminator, consisting of a power unit and one or more static bars. So effective is the *"Midget"*, that Simco can guarantee it *unconditionally*. Simco is America's largest manufacturer specializing in anti-static equipment. Write today about your static problem—in warpers, creels, cards, garnetts, gills and all other textile machinery.

the SIMCO company
920 Walnut Street, Lansdale, Pa.

## SUPPLIER NOTES

*(from page 16)*

gia, Alabama, eastern Tennessee, and northern Florida.

Russell A. Graham, vice-president for engineering and a director of Maremont Corp., and a vice-president and director of **Saco-Lowell Shops**, has been appointed executive vice-president and general manager of the textile machinery division of Saco-Lowell Shops. Royden Walters, executive vice-president, has retired. • • • The firm has announced receipt of an order from Cleveland Mills for eight spinning frames and one 4-drum dryer. The firm has also announced that B. F. Goodrich Co. has purchased nine FS-2 changeovers for the Martha Mills division in Thomaston, Ga. Adelaide Mills, Inc., has purchased four roving frames for its plant in Anniston, Ala., and Lebanon Knitting Mill, Inc., has ordered six worsted spinning frames and one roving frame.

Frank H. Kaufmann, vice-president and general plant manager of **Steel Heddle Mfg. Co.**, has been elected president of the Alumni Association of the Philadelphia College of Textiles and Science.

Thomas F. Rogers has joined the staff of **Virginia Chemicals & Smelting Co.** as a technical service representative.

Six regional sales office managers have been named for the General Chemical Division of **Allied Chemical Corp.** as follows: Arthur H. Baker, New York metropolitan; Albert B. Connelly, Houston; Harold E. Donaldson, St. Louis; William P. Doyle, Buffalo; Edmund R. Lett, Birmingham; and Wesley G. Webster, Denver.

"Cost Reduction Through Materials Handling" will be the theme of the ninth annual essay contest sponsored by the industrial truck division of **Clark Equipment Co.**, and conducted by the American Material Handling Society.

**Shawinigan Resins Corp.** has announced the appointment of **The Breffeilh Co.** as sales agent in Miss., Ala., metropolitan New Orleans, and Pensacola, Fla.

W. R. Becker has been appointed district manager of the Charlotte, N. C., office of **The Louis Allis Co.**

Joseph Bowler, Jr. has been named general sales manager of the textile division of **Dixon Corp.**

Jack M. Blalock has been named manager of heavy chemical sales for the general chemical division of **Allied Chemical Corp.**

**Continental Gin Co.** has begun the exclusive manufacture, sales, and service of the patented automatic cotton sampler previously manufactured by Lab-Quip Engineering Corp.

Charles A. Suter has been elected president of **Geigy Chemical Corp.**, succeeding William F. Zipse, who has been named chairman of the executive committee.

Ralph E. Taylor has been appointed branch manager for the **Chas. S. Tanner Co.** in Columbus, Ga.

An office, laboratory, and warehouse has been constructed in Charlotte, N. C., by **Alliance Chemical Corp.**

*Continued on page 46*

Mr. Graham
*Saco-Lowell*

Mr. Taylor
*Chas. Tanner*

Mr. Becker
*Louis Allis*

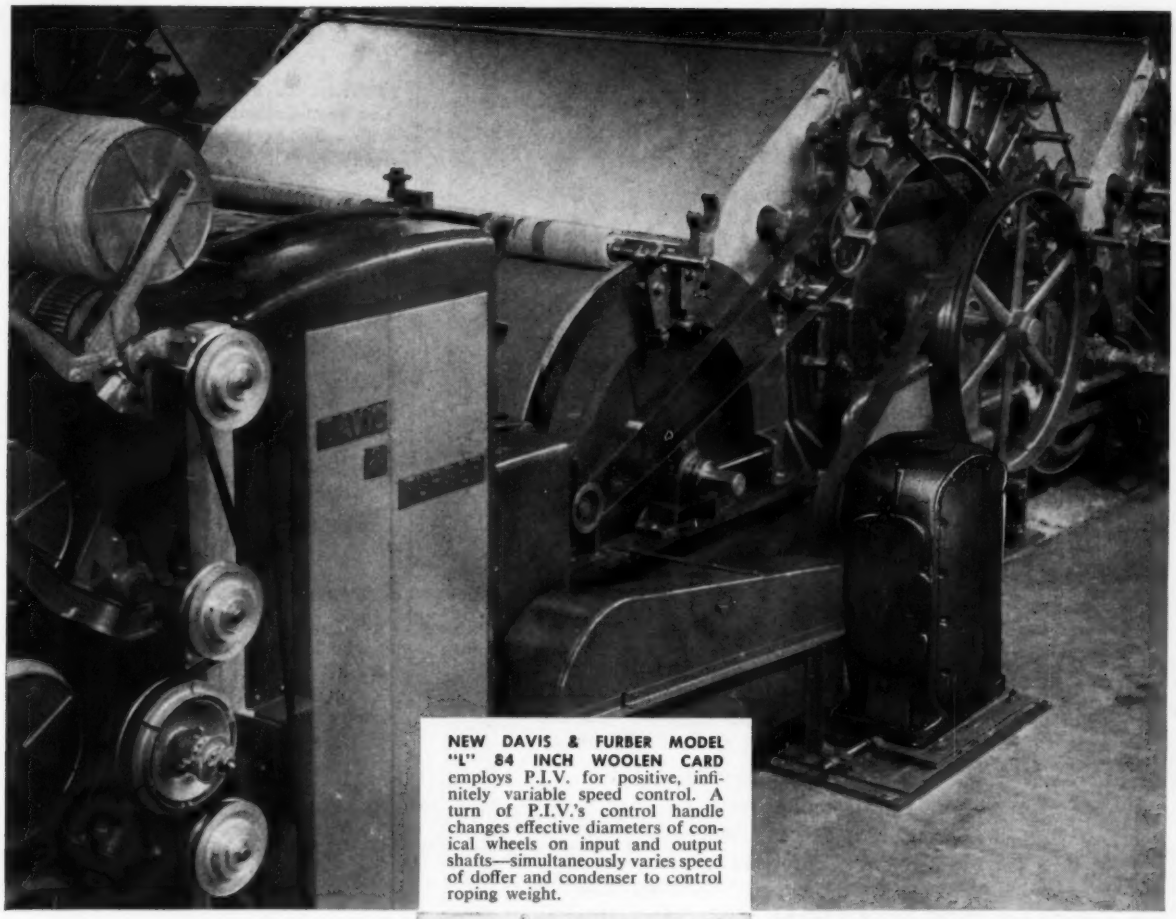
Mr. Bowler
*Dixon Corp.*

Mr. Kaufmann
*Steel Heddle*

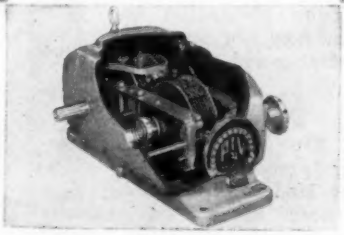
Mr. Rogers
*Virginia Chemicals*



*For further information use Handy Return Card, Page 201*



**NEW DAVIS & FURBER MODEL "L" 84 INCH WOOLEN CARD** employs P.I.V. for positive, infinitely variable speed control. A turn of P.I.V.'s control handle changes effective diameters of conical wheels on input and output shafts—simultaneously varies speed of doffer and condenser to control roping weight.



*Unique in operation . . .*

*unmatched in accuracy . . .*

# For stepless, slipless speed changing

## . . . there's nothing like P.I.V.

Where operations requiring variable speed control can't tolerate slip—no other mechanical drive is equipped for the job like Link-Belt P.I.V. With its all-metal, self-tooth-forming chain that maintains positive grip with radially grooved wheels, it offers a degree of accuracy . . . a level of efficiency—unique in the field. Speeds can be varied in an instant, regardless of load, without interrupting the driven machine. And P.I.V.'s all-metal construction ignores atmospheric conditions.

Contact your nearest Link-Belt office for more information about P.I.V. drives, ½ to 25 hp. Ask for catalog.

**LINK-BELT**

**P.I.V. VARIABLE SPEED DRIVES**

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs; Switzerland, Geneva. Representatives Throughout the World. 18,738

# MODERNIZATION
## means
## PRODUCTION IMPROVEMENT

Mill Modernization never ends in Progressive Mills. As a guide, an up-to-date chart of machinery conditions and production possibilities is constantly followed. Modern management always plans or implements studied improvements accordingly.

**MODERNIZATION** You can benefit in many ways by Mill Modernization, through Davis & Furber's "Coordinated Production." This type of Production puts into one package D&F new equipment, conversion of existing equipment, supplies, accessories, spare parts, technical and engineering services as needed. It ties them right into your production needs.

**THE FIRST STEP** The first step is to talk direct to your Davis & Furber man, or contact us at North Andover, or Charlotte. From then on, you can get the following, usually without cost or obligation:

1. Professional Preliminary Counsel.
2. Actual in-the-mill Survey.
3. Formal Fact Presentation.
4. Post-Survey Conference.

**YOUR OBLIGATION** Your obligation to yourself begins when we show you how you can meet your production requirements profitably and at reasonable cost.

**STAY COMPETITIVE** Our studies are based on knowing what your woolen processing machinery can turn out *before* and *after* Modernization. The D&F survey will tell you what needs to be done to remain competitive.

Now is the time to start action for immediate or long-range production improvement.

P.S. Copies of the new reprint on Yarn Mill Modernization are yours for the asking. Write today.

DAVIS & FURBER
MACHINE COMPANY
TEXTILE MACHINERY DESIGNERS AND MANUFACTURERS
North Andover, Mass.
Charlotte, North Carolina
Member — American Textile Machinery Association

AD 15-4

CARDS • SPINNING FRAMES • PREPARATORY MACHINERY • WARP DRESSING MACHINERY • FINISHING MACHINERY
MACHINERY MODERNIZATION • ACCESSORIES, SUPPLIES, CARD & NAPPER CLOTHING, GARNET WIRE, TAPES & APRONS
SPARE PARTS • TECHNICAL SERVICE & CONSULTATION


## SUPPLIER NOTES

*(from page 44)*

**Ernest L. Frankl Associates, Inc.** has been named U. S. agent for the following European firms: **Ateliers Raxhon,** Theux Lez-Verviers, Belgium (manufacturers of wool dry finishing equipment); **Stork & Co.'s Apparatenfabriek N. V.,** Amsterdam, Holland (manufacturers of wet finishing machines, including screen printing machines); **Croon & Lucke GmbH,** Koeln-Ehrenfeld, Germany

Mr. Meadows

(manufacturers of skein and ball winding machines); **Scholl AG,** Zofingen, Switzerland (manufacturers of package and skein dyeing equipment). * * * Robert H. Meadows has been appointed sales representative for the southern states. Mr. Meadows will be headquartered in Charlotte, N. C.

**The Roberts Company** has announced the purchase of **Southeastern Loom & Machine Works,** a manufacturer of loom repair parts, card coilers, and roving frames. The acquisition will be operated as a division of the parent firm. Plans call for expanding the foundry, giving it full metallurgical quality control, and modernizing.

John Bierie has been appointed to the position of assistant western division sales manager for **Clinton Corn Processing Co.** Robert H. Boegel has been named New York district manager.

**Enjay Chemical Co.,** a division of Humble Oil & Refining Co., and **J. P. Stevens & Co., Inc.,** have purchased the operating assets and facilities of **National Plastic Products Co.** For this purpose, Enjay and Stevens have formed a new jointly-owned company, which will continue the National Plastic name under present management.

Howard P. Brokaw has been named director of the industrial marketing division of the textile fibers department of **E. I. du Pont de Nemours & Co., Inc.**



*For further information use Handy Return Card, Page 201*

# Brings cushioned, soft starts to textile machinery!

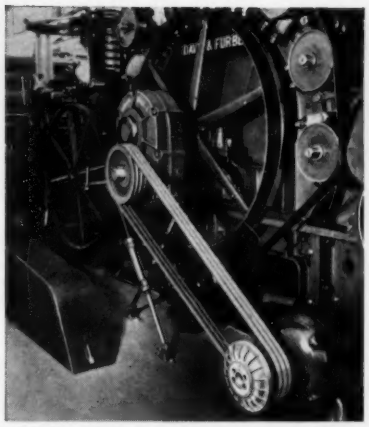
Flexidyne picks up the load smoothly—saves down time from broken ends, keeps yarn uniform. It accelerates quickly to full speed and then operates at 100% efficiency. It saves on motors, controls and power—reduces maintenance—protects motors against shock and overload. Torque can be changed by varying the dry flow charge of heat treated steel shot that is employed to start loads *with fluid ease*. This revolutionary drive is being used with great success in:

**• openers • extractors • condensers • beaters • pickers • cotton, wool and synthetic cards • warpers • twisters • roving frames • fly frames • slubbers • tenter frames • slashers • cloth rolling heads • cloth shearing machines**

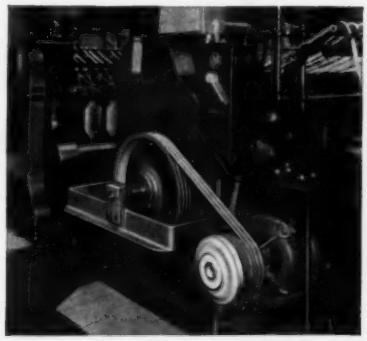
Flexidyne is available from stock in 8 drive sizes and 10 coupling sizes for capacities from fractional to 1000 hp. Ask your Dodge Distributor, or write us for complete technical bulletin.

Dodge Manufacturing Corporation, 3500 Union Street, Mishawaka, Ind.

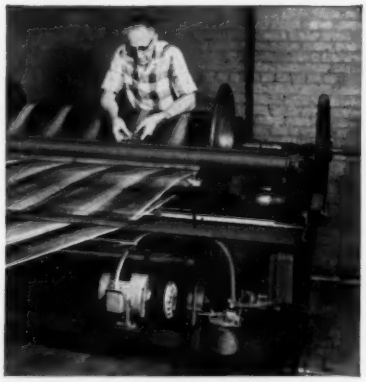
*The Products with the Pluses...* **DODGE** *of Mishawaka, Ind.*



DAVIS & FURBER 60" WOOLEN CARD



ROVING FRAMES



LONG RAIL BEAM WARPERS

**FLEXIDYNE**

**THE DRY FLUID DRIVE**

**CALL THE TRANSMISSIONEER**—your local Dodge Distributor. Look under "Dodge Transmissioneer" in the *white* pages of your telephone book. Factory trained by Dodge, he can give you valuable assistance.

ON THE DAVIS & FURBER MODERN **H** WOOL FRAME

## YOU FIND THE ULTRA-MODERN

"DUALUBE"
PATENT PENDING

**PRESSURE LUBRICATED RINGS**

Available in both Conical and Vertical type rings

Here for the first time a pressure-system ring which distributes either grease or oil around the circumference with equal effectiveness. The improved lubrication is permitting higher speeds with longer traveler life.

**SIZES 43/64" AND UP.**

**FITS ALL SYSTEMS:**
**ALEMITE — LINCOLN**

***Write for Literature and Price Data***

**WHITINSVILLE (MASS.) SPINNING RING CO.**
DIAMOND FINISH
*Makers of Spinning and Twister Rings since 1873*

Rep. for the Carolinas & Va.: H. L. WILLIAMS, 2825 Spring Valley Rd., Charlotte, N.C.
Rep. for Ala., Ga., & Tenn.: C. E. "CHAD" DAVIS, East Lake Shore Drive, Dalton, Ga.

## M & W Two-Piece Roller Type tenter clip greatly reduces costly down time . . .

AS SHOWN, a single socket-head cap screw and lock washer rigidly hold the two sections of this new clip together. Accurate machining also locks the two parts together and prevents any movement between them.

In case of damage or wear, the top section can promptly be removed and replaced, leaving the bottom of the chain in place on the frame—and operation can be resumed immediately.

- ★ Savings on down time are exceptional.
- ★ All parts are easily accessible and removable parts are interchangeable.
- ★ No expensive rivets to knock out and replace.
- ★ If whole chain needs repair, this clip speeds up removal—reduces repair cost.

Get all advantages we have built into No. 11 Roller Type Tenter Clip since 1940—*plus* this unequalled new two-piece convenience and economy.

M & W

***For all-inclusive tentering see M & W!***

**MARSHALL and WILLIAMS CORPORATION**
PROVIDENCE, R. I. GREENVILLE, S. C.
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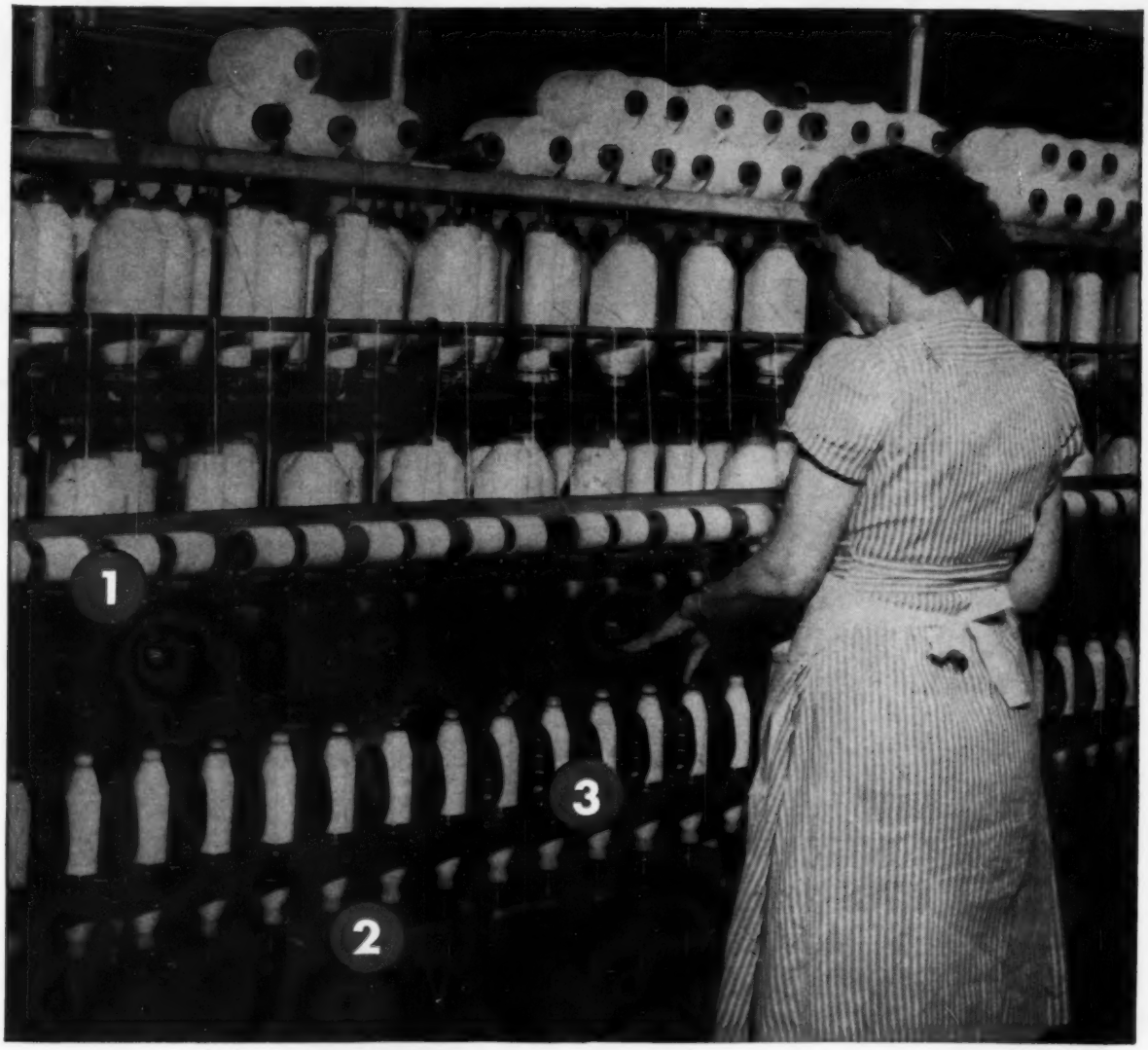


# THESE ESSO PRODUCTS WILL HELP YOU HEAR A SMOOTH, STEADY HUM IN YOUR MILL...

**1. EPIC® 3F** Grease has excellent film strength to withstand high bearing pressures. Extra oiliness reduces internal friction and starting torque. For use where lubricant must stay in place and not spatter.

**2. SPINESSO®** oils are especially formulated to meet the requirements of high-speed spinning and twisting spindles. They resist sludging due to oxidation, assure clean, gum-free operation for long lubrication cycles, and provide instant lubrication during critical start-up periods.

**3. TELURA®** spindle and twister-ring oils cling to fast-moving parts, resist oxidization and discoloring. Lubricate for long periods without forming sludge or varnish.

**NEBULA® EP** multi-use grease for textile machine gears and bearings. It requires less make-up, resists the effects of excessive humidity, wet conditions, and high temperatures common to textile equipment bearings.

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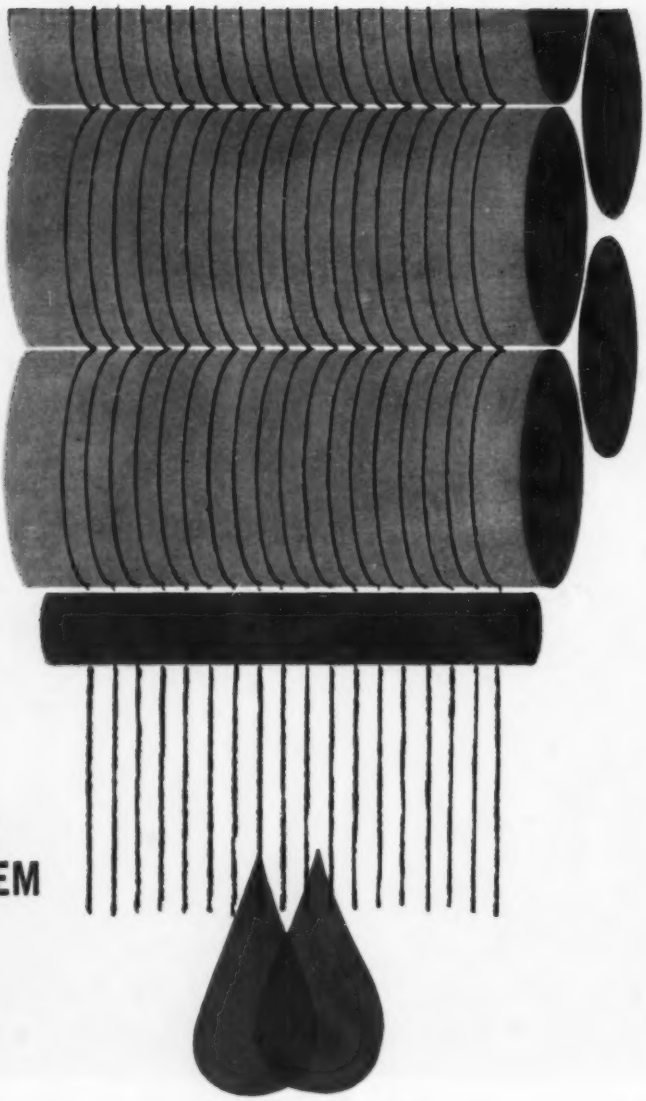

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Textile Industries
OCTOBER 1961

# nonwovens

## materials, methods, marketing

by James W. Howden
*President*
*James W. Howden Co., Inc.*
*Ramsey, N. J.*

**Exclusive**

This random-web nonwoven fabric is dielectrically bonded to fiberboard for use in automobile door paneling. (Photo courtesy Goodyear Tire & Rubber Co. and Sackner Products, Inc.)

*Continued next page*

# Part 1 — The markets and how to sell them

THE RAPID growth of nonwovens, particularly within the past ten years, has been accompanied by much confusion over the actual effect of this growth on conventional textile markets. There have been well publicized cases of the inroads that nonwovens have made, and there has been much publicity about the "enormous" markets that are opened to textile manufacturers who diversify into the bonded fabrics field.

But it should be emphasized at the outset that the business of manufacturing nonwoven bonded fabrics and batting is not a quick road to riches and glory. If properly approached, skillfully managed, and energetically pursued, nonwoven manufacturing is a sound, profitable business, meriting the full consideration of everyone connected with the textile industry.

In this series of articles, it will be our intent to present a clear and concise picture of the nonwoven industry and its more pertinent aspects. We will define the various types of nonwovens now in use and describe how they are made, how they are utilized, and how they are marketed. To the manufacturer who is developing new nonwoven products it is of primary concern to know something of their potential in the market place. This series will therefore begin with a discussion of the principal factors that are involved in the important function of marketing.

No phase of the nonwoven industry has been more widely discussed and more poorly interpreted than the rate at which nonwoven products are consumed. Estimates of the total market for nonwovens, and reports on their rate of production have ranged from roughly 100 million pounds per year to several times this quantity.

**TABLE 1. Estimated Current Consumption of Nonwoven Products, Million Pounds Annually**

| | |
|---|---|
| 1. Unbonded batting, pads, wadding, and mattress felts (exclusive of insulation) | 425.9 |
| 2. Bonded pads, batting, and mattress felts (exclusive of insulation) | 101.2 |
| 3. Nonwoven bonded fabrics (maximum 6 oz/sq yd) | 133.3 |
| 4. Nonwoven bonded plastic-reinforcing mats | 139.1 |
| 5. Bonded nonwoven insulation batts and pads | 337.1 |
| 6. Punched and needled felts, pads, and mats | 268.4 |
| 7. Wool and combination wool felts (including imports) | 52.7 |
| 8. Plastic and rubber foam pads, batts, mattress, and cushioning | 245.3 |
| TOTAL | 1,703.0 |

Source: U.S. Bureau of the Census reports for 1958, and industry estimates. The total represents an annual sales volume of a little more than $1 billion.

Such a wide disparity in estimating the size of the over-all market and the output of the industry stems principally from a confusion as to what products should be classified as "nonwovens." Of necessity, a wide variety of products is included in the classification. Generically, under the category of nonwoven bonded fabrics and batting, such diverse products are included as mechanically and/or chemically bonded felt; glazed wadding; needle-punched matting; chemically bonded, hard-finish fabrics; chemically bonded batting; and numerous other product types.

The reason for such a diversity of products under a single category becomes apparent upon analysis of the methods by which these products are made. Loose, fluffy batting, for example, can be changed in several instances to dense, hard-finish "fabric" merely by the application of additional heat and pressure at one point in the production line—the product and its method of manufacture being otherwise identical. Numerous other examples of such overlapping of product types could be given. But it is sufficient to say that any realistic appraisal of the market potential of nonwovens will include all product types and methods of manufacture.

*Table 1* gives a breakdown of the current consumption of nonwovens (by product category), determined as nearly as is possible from various governmental, industry, and technical sources.

**How Are Nonwovens Marketed?**

The basic rules for marketing nonwoven bonded fabrics and batting are similar to those applicable to marketing nearly all new products. The task is generally not an easy one, but the rewards for a job well done are usually great.

Experience to date has indicated that roughly one-half of all sales of bonded fabrics is made to new product end uses representing essentially "new" markets. Examples of products that have been developed for completely new markets include the following:

Reinforced plastics—for use in boats, missiles, etc.

Wall coverings—a departure in styling rather than a displacement of paper coverings.

Coated fabrics—for innumerable end uses.

Filters—for end uses where conventional fabrics and papers are not suited.

Acoustical insulation.

Molded fiber components—for garments, automobiles, aircraft, etc.

Insulated underwear.

Disposable garments.

Special purpose tapes—for electrical insulation, heavy-duty strapping, etc.

Chemical-impregnated wipers.

Imprinted overlays.

Seed rolls.

The remaining half of bonded fabric sales is made for displacement end uses; that is, an existing, well-established product is displaced by a product exemplifying a new method of manufacture. Since it is this latter market category that most manufacturers tackle first, we will concentrate our discussion on the problems involved in this area. Later in the series we will take up the problems of marketing new products.

But before listing the exact steps that are required in a marketing program, we will briefly review the factors which determine acceptability of the product at its point of purchase. In doing so we should bear in mind, however, that with few exceptions the great majority of the products are sold to industrial accounts; that is, to manufacturers who later use them in their own product and/or convert them into another end-product for ultimate sale to the customer.

Eventually all products, industrial and consumer alike, are subjected to what has recently been called "value analysis." This analysis has also been referred to as "net utility," "net worth utilization," "effectiveness ratio," and by numerous other handles.

But regardless of the handle that is applied to "value analysis," its meaning is the same: Exactly *what* does the customer get for his money? After all the negative features of a product have been subtracted from its positive features, exactly *what* is left? *Why* should the consumer buy it? *What* value does it give him which he cannot derive from another product, from another supplier, at another time or place? In the long run, then, it is "value" that determines the ultimate acceptability, and success, of a given product.

What, then, determines "value" of a product?

Considering, first, industrial accounts and those in which the product displaces another, the following are factors which contribute to value:

Urgency of need.

Manufacturing use compatibility:

- Advantages?
- Neutral?
- Disadvantages?

End product use compatibility?

- Advantages?
- Neutral?
- Disadvantages?

Delivered cost.

Net cost in use.

Advertising and promotional possibilities and/or "label":

- Advantages?
- Neutral?
- Disadvantages?

The second most important factor in marketing a new product is the sales effort that is applied to it. This includes advertising, sampling, promotion, and the routine "leg work" and "knocking on doors" of individual sales people. It also includes the quality and quantity of the sales effort.

Thus, if a manufacturer wants to enter the nonwoven bonded fabrics field, or wants to expand upon an existing operation, he should begin with a "value analysis" conducted from the customer's point of view.

The most obvious opportunities for nonwovens exist where a product can be developed to offer a specific advantage over an existing product. The advantage may be one of better product performance at the same price, or of equal performance at a lower price. Whatever the specific advantage may be, it must provide the customer with the necessary impetus to change from a traditional material to a nonwoven bonded fabric.

We all know of instances where super salesmanship and phenomenal advertising programs have sold products which have had less to offer in "net value" than some of their competitive alternates. This truism cannot be overlooked. Obviously, then, there are many factors other than "net value" which influence the acceptability and success of a product in the

**Meet the Author**

SKETCHED FOR TI BY L. CAMERON CHAIET

■ JAMES W. HOWDEN entered the nonwoven bonded fabrics and batting field after an extensive manufacturing background in the furniture and allied industries. In 1947, he formed the James W. Howden Co., in Waynesboro, Va.; in the following year the company moved its headquarters to Hawthorne, N. J.

From its inception the Howden firm has engaged in basic research, development, and consulting work relating to all phases of the bonded fabrics industry. The firm has designed and constructed six complete nonwoven bonded fabric installations; and has participated, at one stage or another, in the completion of several other major projects, lending its services in research, development, design, construction, installation, organization, management, marketing, and finance.

While the firm today provides consulting services in such other areas as waste reclamation and new product design and development, the major portion of its work is concerned with the nonwoven bonded fabrics and batting industry.

The company operates a pilot plant and laboratory in Hawthorne, N. J., and maintains a design studio and office at Ramsey, N. J.

Mr. Howden is the inventor of various processes, products, and machines relating to the bonded fabrics and allied textile and plastics industries.

market place. Among these are the following:

1. Advertising and sales promotion applied.
2. Sales effort applied: its quality and quantity.
3. Payment terms.
4. Uniformity of quality.
5. Delivery frequency.
6. Reliability of supply.
7. Uniformity of price.
8. Trade acceptance pressure.
9. Competitive pressure.
10. Technical service availability.

With the foregoing serving as an introduction, we can now divert our attention to the specific markets that exist for nonwovens. At the end of this article, there appears a listing of several hundred products currently in use, or being tested for use, which utilize nonwoven bonded fabrics and batting as primary constituents. The products are arranged by the principal market areas to which they are sold.

**Some Pitfalls.** Manufacturers are often disillusioned in their efforts to capture markets in the bonded fabrics and batting field, despite the fact that their developmental work has been preceded by extensive market research and the product has been tailored to a specific need. That is to say, they have first studied the needs of a given industry or of a large customer and then have brought out a superior product at an advantageous price, only to discover that the product fails to sell.

It is often obvious to people in the trade that some of the large-scale users of nonwovens, of both fabric and batting types, continue to buy goods somewhat lower in quality and/or higher in price when actually higher quality and/or lower in price goods are available to them. Why is this so? Surprisingly enough, there are usually some very good reasons for such purchasing practices.

First of all, when we state that goods are available we must define the extent of availability. In today's highly competitive and complex mass-production operations, reliability of source of supply is of primary importance. This is particularly true where styles and product types change from season to season, or from year to year, and where the finished product has a definite seasonal marketing characteristic. (There are few that do not.)

The products that appear on retail shelves or in dealer showrooms this season were often styled many months (and sometimes years) in advance. When a style or type is "set" in the pilot, pre-manufacturing stage, the manufacturer must be absolutely certain of his source of supply pertaining to quality, uniformity, quantity, delivery schedules, and price. When a manufacturer plans a line months in advance, he must know that at the height of the season there will be a smooth, uninterrupted flow of goods to meet his needs.

Any change in quality, uniformity of thickness or density, delay in delivery, or change in price can spell catastrophe. There are several users of nonwovens who consume a carload of goods every 24 hours at the height of their production season. If the products they use are lightweight, high-volume products and storage space for incoming goods is at a minimum, it sometimes means that a fresh car, or as many as three to four trailer truckloads of goods, must arrive at the plant seven days a week—without fail and over a period of months. Thus, the user must be absolutely certain that his source of supply for these materials is able to maintain this exacting schedule without a hitch.

Many of the large-volume users will not change from a lower-quality, higher-priced material to a better one, though it is offered them at a more favorable price, because they know that the total productive capacity of the supplier's plant on a day-to-day basis cannot meet their peak demands. Or, they may know that this supply/demand ratio is too narrow and that the supplier is committing his entire productive capacity months in advance (but without interim sales between the time orders are placed and the season starts) is in too precarious a position to be relied upon.

Few manufacturers are interested in using one style or type of goods for part of their production and another style or type for the balance—even when they may obtain a superior alternate material at a favorable price. There are exceptions to this practice, of course, but they are not very common.

Another example of restrictions on sales may be found in the policy of many users never to buy goods from a single source of supply—no matter how reliable the source may appear to be. We know of several manufacturers of bonded fabrics and batting who have offered the automobile industry new and improved products (which could be described as "naturals" for the intended usage) only to be turned down cold. The reasons? These manufacturers had developed "new" and/or unique products and were the only sources of supply.

Automobile manufacturers have learned from bitter experience never to rely on single sources of supply, even a source that may have ample productive capacity to maintain seasonal peaks, may be fully staffed and adequately financed, and even willing to post performance bonds to guarantee delivery. There are such unexpected occurrences as strikes, fires, floods, accidents, and the like which prevent delivery—no matter how good the intention or how able or well equipped the supplier may be.

When an automobile plant is turning out a thousand cars a day, and each car may require up to 30 lb of nonwoven materials, the supply of goods must flow uninterruptedly. The presentation of a performance bond as an assurance of furnishing one or two of the hundreds of parts required in the modern automobile is virtually meaningless if a delay in supplying these items causes the loss of millions of dollars of production.

This same rule for purchasing also applies in the furniture and bedding industries. And there are others. Many furniture plants in this country turn out in excess of 1000 suites a week at the height of their season. The physical bulk of these products is such that the plants would grind to a halt within a matter of hours, idling hun-

dreds of men, if only one of the many components did not arrive when and where needed.

**The Reverse Side of the Coin.** Reliability in supplying goods is of course a two-way street. There have been too many instances of buyers applying the pressure on suppliers to shave a few points off the price. Knowing that the supplier's production was "tied up" for the best part of the season to the buyer's needs, the buyer would decide that "conditions in the trade," or some other nonsensical factor, no longer made possible payment of the agreed-upon price.

If the supplier balked and refused to accept the arbitrary price cut, the buyer would suddenly decide that every second or third shipment of material was "defective." He would reject the shipment and return it to the supplier. When you have paid the freight both ways on several carloads of goods you are more inclined to accept a price cut and continue to ship for the balance of the season for whatever profit may remain in the transaction.

Along the same line, it is now pretty well known in the trade that there have been large-volume manufacturers who have placed orders with several competitive suppliers for two to three times their requirements to assure themselves of an uninterrupted flow of materials at the peak of their operations. Thus, if one or more of the suppliers did not deliver on time, the manufacturers were still assured of a continuing flow of goods. If all of the suppliers delivered on time, however, the excess quantity of goods was merely rejected on the grounds that it was "unacceptable," "below grade," "defective," and so on, ad nauseum—usually without opening the containers, and in some instances without opening the truck.

There are variations on this theme, so to speak, and other practices which have served to slow down the growth of the nonwoven industry. Despite such "shenanigans" the industry as a whole has continued to grow and prosper at a remarkable rate.

In summarizing the function of selling, it may be seen that it does not always consist merely of salesmanship, pricing, or quality. Often it consists of the most important task of negotiating and establishing a sound working relationship between the supplier and the consumer. This relationship may be described as a rapport based on complete confidence. The consumer must be certain that he will have unfailing delivery, uniform quality, and a consistent price. The supplier, in turn, must be certain of fair inspection, uninterrupted flow of goods, payment in accord with pre-arranged terms, and ample notice of changes in the demand load.

**The Outlook:** Growth of markets and the rise of new ones. The somewhat loosely categorized market of nonwovens is often said to be "doubling in size every three years." While this prophecy is true enough for some nonwoven products, it does not apply to others. It is apparent that the lightweight bonded fabrics, bonded battings, plastic reinforcing mats, foam fillers, and certain types of punched felts are all experiencing a far better than average rate of growth. But it is equally apparent that some of the older "basic" products, such as unbonded batting and conventional felt, are barely holding their own.

The reasons for the growth of some products and the relative stagnation of others are not readily apparent. But generally speaking, they are the result of changes in tastes and standards of the consuming public—and consequently in the demands of the industrial level consumer. Added to these is the fact that a large proportion of the sales of nonwoven bonded fabrics and batting is made to "new" product uses, which did not previously exist.

Directly or indirectly, it is the ultimate consumer who dictates the type of goods that will be made. Through need, or desire that is transformed into need, the consumer specifies every pound of goods that is produced—though he is seldom aware that this process is going on or that he is responsible for it.

To the market researcher, it is readily apparent that the public is asking, and in many instances demanding, much more than it did five years ago. Its demands will be even more acute five and ten years hence. Thus, any manufacturer who hopes to grow and prosper as the population of our nation expands, will have to keep pace with its demands. The record books are filled with "standard" and "staple" products which are no longer in existence today—along with the firms that manufactured them. The rules for survival are no different today; nor are they likely to be 10 years hence.

It has been only a few years since many substantial people in the bedding industry were scoffing at the percentage of business that would be taken away by high-priced foams and synthetic fiber fillers. Today, both foam and synthetic fiber bedding and cushioning, at well over $1.00 per pound, have captured a substantial volume in this industry—and they are growing rapidly. This does not mean that our entire population will sleep on molded foam or bonded batting 10 years from now. It does mean that in all probability a substantially larger percentage of our population will find itself sleeping on these new products; and more importantly, that quality will have to improve in all grades of goods from lowest to highest.

As good as polyester fiber batting is today, it is highly probable that 10 years from now it will be supplanted by something better. Likewise, the tonnage business in the unbonded cotton batting filler of today will largely be replaced by a product at least more akin to the currently superior bonded battings, synthetic battings, or molded foams. In the increasingly important, purely "industrial" applications, as good as the combination-bonded synthetic fiber filter felts are today, it is very likely that 10 years from now they will be displaced by a better product. In the high-volume home heating market, the mineral fiber filter cells of today will undoubtedly give way to more efficient, lower cost units that will be available in the future.

It is difficult to say whether

the accelerated trend toward continual displacement of products will continue. But it is already well known that nearly one-half of all consumer products sold today were not in existence 15 years ago. This unmistakable trend toward the birth of new markets places the nonwoven bonded fabrics industry in a favorable position because of the inherent flexibility that is built into nonwoven bonded process lines. It argues well for the fact that the slightly phenomenal growth of nonwoven products, exhibited in some areas, will continue for years to come.

If we consider the over-all market in terms of numbers only, then the coming "population explosion" will create substantially broadened markets for all types of nonwovens. Over the long term, the growth of semi-durable goods is expected to maintain or improve the post-war rate of 2.9 per cent per year. The index of semi-durables will move from the 1960 average of 118.3 to an expected level of 179 by 1970. The total increase in consumption in 1970, compared to 1960, will be 51 per cent.

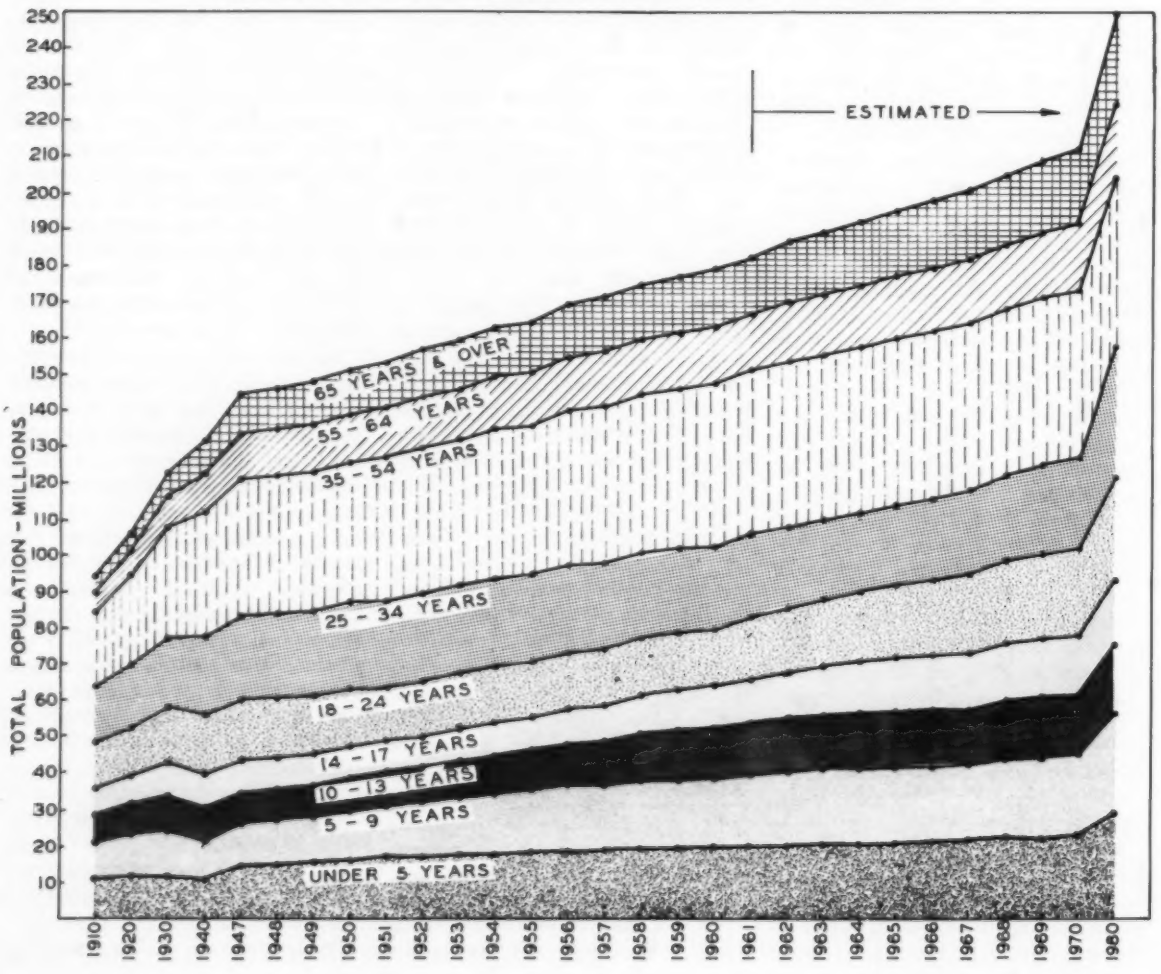
The accompanying population chart clearly shows from where our principal over-all industry growth is coming, and its anticipated extent within the primary purchasing and useage groups.

**Finishing:** An area of opportunities. From the pattern of growth of nonwoven products and their acceptance by the consuming public, it is apparent that the following properties will become of increasing importance in the years ahead:

Washability
Dry-cleaning compatibility
Mildew resistance
Light fastness and non-yellowing
Color fastness
Tensile strength
Resilience
Flame resistance
Chemical resistance
High temperature stability
Abrasion resistance (scuff)
Finish
Hand
Drape

In the areas of lightweight bonded fabrics, the industry is now at the point in technology where woven cotton goods were several generations ago. Only a very small percentage of these fabrics is currently bleached, dyed, printed, or embossed. Essentially

Population of the United States by age groups, 1910-1980. (Source: Bureau of the Census)



# Manufacturing Methods for Nonwoven Products

**Architectural—Building Supply Trades**
Acoustical curtains—S*
Air filters—W
Insulating batt—P
Acoustical batt (Reynolds system)—P
Insulating strip (weather)—W, M, C
Acoustical, modular units—W, M, C
Acoustical tile—P, M, C
Floor tile—P
Floor covering—W, M, C
Wall covering—W, M, C

**Automotive, General**
Door liners—P, S
Headboard liners (engine wall)—P, W
Roof liners (head liners)—P, S
Convertible tops—F, P, W, C
Cushion fillers—P, S
Toppers—S
Insulators—W, M, C
Covers—P, S, W, M, C
Molded trim—P
Pads, acoustical—W, M, C
Insulating—P, S
Vibration—W, M, C
Molded arm rests—P
Dash pads—P
Door trim—P, S
Floor liner—S, M, C
Undercarpeting—W, M, C
Spring liners—F, W, M, C
Glove compartment liner—P, S
Carpeting—W, M, C
Sun shade (molded)—P
(Covers)—F, S
Bearing seals—F, M, C
Oil wicks—F, M, C
Mufflers—P, M

**Clothing Trades**
OUTERWEAR
Skirts—F, M, C
Jackets—F, M, C
Capes—P, S, M, C
Costumes—P, S, M, C
Shorts, adult—F, M, C
Children—W
Dresses—F, S, M, C
Hats—F, W, M, C
Scarves, utility—P, S
Novelty—P, S
Shawls—F, S, M, C
Raincoats (disposable)—W
Belts, ladies' (novelty)—S, W, M, C
Children's—W, M, C
Sport and car coats—F, S, M, C
Coveralls—S, W, M, C
OTHER
Aprons—P, S
Brassiere cups—W
Falsies—P
Diapers—S
Shoulder pads—P
Sleeve heads—P, S
Coat fronts—P, W
Interlining—W
Coat interliners (insulated)—S, M, C
Handkerchiefs—W
Chafer pads—F
Nightgowns—F, S
Beach robes—P, W
Underwear, general—F, S, M, C
Disposable panties—P, S, W, C
Slippers—F, W, M, C
Marking tape—F, S
Process tags—W, M, C
Petticoats (novelty)—F, S
Blouses—F, S
Skirts—F, S
Tunics—P, W
Vests—F, P, W, M, C
Show fabrics (novelty)—S, M, C
Shoe innersoles—P, W
Liners—P, W
Heel pads—P, W
Arches—F, S, M, C
Cushions—F, S
Boot insulators—F, P, M, C
Leggings—W, M, C
Ties—F, S

**Coated Fabrics Trade**
Artificial leather—W
Backing fabrics, general—S, W
Wall—W
Upholstery—F, S, W, M, C
Coveralls—S, W, M, C
Aprons, industrial—W
Electrical tape—F, W
Strapping tape—W
Freezer wrap—S, W
Friction tape—F, W
Decorative wrap—P, S, W
Convertible tops—F, P, W, C
Wall covering—S, W
Floor covering—F, S, W, M, C
Laminated plastics—F, P, S, W
Lampshades—F, S, W
Tarpaulins—S, W
Tenting—S, W
Linoleum—P, W, M, C
Map sheet backing—F, W
Meat wrappers—F, S
Oilcloth—S, W
Protective clothing—F, S, W
Sausage casing—W
Shrouds—P, S, W
Tea bags—W
Wire wrapping—S, W
Plastic underlays—W
Bagging—S, W, M, C
Bed-pan covers—S, W
Book cloth—W
Cable wrapping—F, W, M, C
Folding doors—P, S, W
Packaging wrap, permeable—F, P, S
Impermeable—W
Beach bags—P

*(Continued next page)*

***What the Letters F, P, S, W, M, and C Mean**

F—Fiber Bonding. Thermoplastic or two-stage fiber binders are mixed with the body fibers at the start of the process, and subsequently fused or cured to hold the entire product together.

P—Powder Bonding. Dry thermoplastic or thermosetting resins, in powder form, are mixed with the body fibers at the start of the process and/or are added to the web at an intermediate point in the process. During subsequent curing, the resins are cured or fused to hold the entire product together.

S—Spray Bonding. Thermoplastic or two-stage resins, in emulsion or solution form, are sprayed on the fibers at the start of the process and/or are sprayed on the web at an intermediate point in the process. During subsequent curing, the resins are cured or fused to hold the entire product together. A common variation of this method is to spray chemicals on chemically reactive body fibers at the start of the process.

W—Saturation or Wet Bonding. The formed, though unbonded, web passes through a bath of thermoplastic or thermosetting resins (in solution or emulsion form) and then into a curing range for a fusion or curing of the resins to hold the entire product together.

M—Mechanical Bonding. The principal body fibers in the completed web are mechanically compacted, tangled, and interlocked to provide a bond of sufficient strength to hold the entire product together.

C—Combination Bonding. Two or more bonding methods are combined into a single process to produce a product with a superior bond or with other advantageous properties.

## Manufacturing Methods for Nonwoven Products *continued from page 59*

Beach rolls—P
Sleeping bags—P, S
Mulch covers—W
Food wrap—W
Rainwear (disposable)—F, W
(Utility)—F, S, W, M, C
Awnings—W
Patio covers—W
Patio screens—P, W
Silos—W
Portable warehouses—F, S, W
Geodesic domes—S, W, M, C
Shower curtains—W
Emergency boats—W
Tags—S, W, M, C

**Filters, General**

Synthetic fiber manufacture—F, M, C
Chemical—F, P, M, C
Process air—P, S
Process fluid—F, M, C
Heating system air—S
Air conditioning—P, S
Oil, process—F, P, S, M, C
Hydraulic—P, S, M, C
Automotive—F, P
Diesel—P, W, M, C
Carburetor, dry type—P, S
Oil type—P, S, M, C
Water, process—F, W, M
Waste—P, W, M, C
Breathing masks—F, P
Breathing mask, cartridges—F, P, S
Respirators—F, P, S
Resuscitators—F, P, S, M, C
Area exhaust, dust—P, S
Fumes—P, S
Fire recovery—P, S, W, M, C
Beer and wine—F, M, C
Decontamination, disposable—P, S
Milk—F, S
Cheese—F, S, M
Gas purification—P, S, W
Odor balance—P, S, W
Paint—P, S, M

**Home Furnishings Trade**

Pillow filler—P
Pillow filler, nenallergenic—F, P
Pillow subcover—F, S, W
Cushion, insulator—P, W, M, C
Filler—P
Subcover—F, S, W
Mattress, insulator—S, W, M, C
Filler—P
Topper—P, S
Insulator/filler—P, W, M, C
Sidewall—P
Furniture, insulator—S, W, M, C
Filler—P
Insulator/filler—P, W, M, C
Wrap cover—S, W
Molded insert—P
Furniture, topper—P, S
Upholstery fabric—F, S, W, M, C
Coated—S, W
Embossed—S, W
Backed—S, W, M, C
Drawer and door bumper pads—P
Silver/jewel drawer lining—P
Glass top, insulator pads—P, S
Decorative liner—P, S
Seat pads, kitchen chair—P
Bar stool—P
Ottomans—P
Bedspreads—F, S, W
Card table covers—P, S, W
Undercarpeting—S, W, M, C
Cords—F, W, M, C
Curtains—F, S, W
Tablecloths—S, W
Cover Cloths—S, W
Dish cloths—S, W
Dish towels—F, S, W
Doilies—P, S, W
Drapes—F, S, W
Dust cloths—S, W
Carpeting (solid)—F, S, M, C
(Modular)—S, W, M, C
Decorative wall tiles—P, W
Headboard pads—P
Napkins—S, W
Place mats—S, W
Crib pads—P
Play pen pads—P
Screens (room dividers)—P, W
Picture mats—P, S, W
Quilting fillers, comforters—P, S
Closet accessories — P, S
Wash cloths—F, S, W, M, C
Towels—S, W
Wiping cloths—S, W
Waxing cloths—P, S, W, C
Window shades—S, W
Blankets—F, S, M, C
Shower curtains—W
Ironing board pads—P, S
Facial tissue—F, S
Flower seed rolls—P, S
Electrical carpeting—F, P, M, C
Electrical wall covering—F, P, M, C
Electrical curtains—F, P, M, C
Electrical heat pads—F, P, M, C

**Industrial, General**

Pressure-sensitive tape—S, W
Heat-sensitive tape—P, S
Solvent-sensitive tape—P, W
Bagging—P, S, W, M, C
Wrapping—P, S, M, C
Protective pads—P, S
Splash pads—F, P, S
Filters—F, P, S, M, C
Buffing wheels—F, P
Casket liners—P
Cigarette filters—F, S
Cordage and rope—F, P, M, C
Decontamination clothing—F, S, W
Farm seed rolls—P, S
Mulch—S, W
Fertilizer blanket—P, S, W
Grass mat—P, S, W
Insulation—P
Laminated plastics—F, P, S, W, M, C
Masks—P, S
Meat wrappers—F, S, W
Permanent-wave pads—P, S, W
Survey markers—S, W
Tags—S, W, M, C
Window dressing—P, S
Wire and cable wrapping—S, W, M, C
Pipe wrapping—P, S, M, C
Pump packing (impreg)—F, P, M, C
Pipe packing—F, P, S, M, C

MILITARY USES

Ground cloths—P, S, M, C
Camouflage—P, S
Emergency cover—P, S, M, C
Signal cloth—P, S
Sails—S, W
Mothballing—P, S

PACKAGING USES

Outer wrap—S, W, M, C
Inner wrap—P, S
Laminated wrap—F, P, S
Filler—P
Molded filler—P
Molded insert—P
Block cushion—P, S
Sheet cushion—P, S
Molded sheet—P, S
Decorative—P, S
Impregnated—P, S, W
Electrical blankets—P, S, M, C
Electrical curtains—F, P, S, M, C
Electrical rugs—F, P, S, M, C
Electrical heat pads—F, P, S, M, C
Vibration insulators — P, S, M, C
Mounting pads—P, S, M, C
Machinery—P, S, M, C
Business machines—P, S, M, C
Truck and landing bumpers—P, M, C
Mechanics mats—P, S
In-process blankets—P
Polishing pads—P, S, W
Abrasive wheels—F, P, M, C
Strapping tape—F, S, W

**Medical, Surgical, Laboratory**

Absorbent applique—F, P, S
Splash and wipe pads—S, W
Bandages—F, S, W
Bed-pan covers—S, W
Bed pads (disposable)—S, W
Pillow pads (disposable)—S, W
Bibs (hospital)—S, W
Bibs (dental)—P, S, W
Laboratory aprons—P, S, W
Disposable contamination suits—P, S, W
Hoods—F, S, W
Caps—P, W
Sleeve guards—P, W
Towels—S, W

Surgical masks—F, P, S
Sanitary napkin cover—F, P, S
Sanitary napkin pad—P, S, M, C
Sheets—F, S, W
Pillowcases—F, S, W
Shrouds (disposable)—P, S, W
Filter Cloths—F, P, S, M, C
Lab ware cushioning—P
Insulating wraps—P, M, C
Stand pads (disposable)—P, M, C

**Plastics, General**

Fenestration—P
Side wall—P, S
Structural wall—P, M, C
Honeycomb—P, M, C
Interior partition—P
Roof lights—P, S
Doors—P
Fire hatches—P, S
Shower doors—P, S
Patio screens—P, S, W
Awnings—S, W
Carport covers—S, W
Floor tile—P, M, C
Acoustical, modular — W, M, C
Acoustical tile—P, M, C
Counters—F, P, S, W
Tables—P, S, W
Cornices—P, M
Structural beams—P, M
Laminated siding—P, S, W
Furniture, drawers—P, M
Legs—P
Core stock—P, M
Plywood laminate—P, S, W
Plywood glue carrier—P, S, W
Luggage, filler—P, M
Scrim top—F, P, S
Lamp shades—S, W
Lamp bases—P
Chemical, pipe—F, P, S
Fittings—F, P, S
Irrigation pipe—P, S
Ductwork—P, S, W
Fume hoods—P, S
Tank liners—F, P, W
Tanks, molded—P, M, C
Aircraft trim—P
Auto trim—P
Food trays—P, S
Forming dies—P, S, M, C
Jigs—P, S, M, C
Fixtures—P, S, M, C
Panels, electronic—P, S
Aircraft—P, S
Auto—P, S
Industrial—P, S
Fluorescent light, shell—P, S, W
Diffusers—P, S
Boat, hulls—P
Trim—P, S
Sails—S, W
Emergency—F, S, W
TV sets—P, M
Radios—P, M
Auto and truck bodies—P, M, C
Pressure vessels—P, M, C
Tote boxes—P, W, M, C
Lug boxes—W, M, C
Ceiling fixtures—P, S
Radomes—F, M, C
Geodesic panels—P, S, M, C
Binder resin batts—F, P, W
Pre-preg mats—F, P, S, W, M, C
Swimming pools—P, S
Partitions—P, S, W
W-C seats—P
Urinals—P, M, C
Sinks—P, M, C
Concrete molds—P, S, M, C
Gaskets—F, P, S, W, M, C
Brake lining—P, S, M, C
Clutch facing—P, S, M, C
Air conditioner housing—P, M
Turbine rotor blades—F, P, M
Battery cases—F, P, S, M
Bus ducts—P, S
Conduit—P, S
Fire walls—P, S, W
Hoppers—P, S, M, C
Sewer pipe—P, S, W

**Sporting Goods**

Beach rolls—P
Beach blankets—F, P, M C
Sleeping bags—F, P, S, M, C
Storm jackets, outer—F, P, S, M, C
Filler—P, S
Beach toys—P, S
Surf mats—S, W
Medicine balls—P, S
Beach houses, exterior—P, S, M, C
Pool screens—S, W
Tents—S, W
Umbrellas—S, W
Golf bags—S, W, M, C
Beach bags, insulated—P, S
Life preservers—P, S
Boat fenders—P, S
Sail cloth—S, W
Camp rugs—P, S, M, C
Ground cloths—P, S, M, C
Blankets—F, P, S, M, C
Golf towels—S, W

**Textiles, General**

Cheese wrap—F, S, W
Coffee bags—S, W
Tea bags—S, W
Curtains—F, S, W
Drapes—F, S, W
Tablecloths—S, W
Napkins—S, W
Filter cloths—F, P, S, M, C
Backing fabrics—P, S, W. M, C
Pennants and banners—P, S, W
Quilting, housecoats—P, S
Closet accessories—P, S
Comforters—P, S

QUILTING

Handbags, outer—S, W
Handbags, liners—P, S
Beach bags, outer—S, W
Beach bags, insulation—P, S
Insulated underwear—F, S
Seat covers—F, P, S
Door liners—P, S
Sleeping bags—F, P, S
Ribbons—F, S, W
Pile fabric base—P, S, W, M, C
Show polishing cloths—S, W
Impregnated wipers—P, S, W
Tags—S, W, M, C
Tapes—F, S, W
Markers—P, S, W
Tobacco cloth—S, W
Blankets—F, P, S, M, C
Ground cloths—P, S, M, C
Sail cloth—S, W
Drop cloths—S, W

**Toys, General**

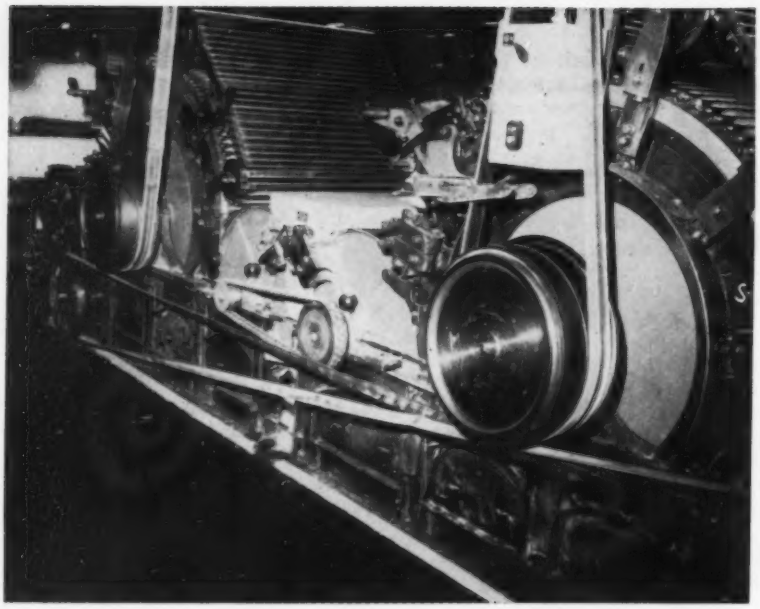
Dolls, cover—S, W
Filler—P, S
Doll clothes—P, S, W
Molded, nonallergenic—F, P, S
Play balls—P, S
Kites—S, W
Press-apply kits—P, S, W
Cut-out kits—P, S, W
Arts training kits—P, S, W, M, C

the same techniques that have made cotton fabrics a household staple throughout the world must now be applied to nonwoven bonded fabrics if they are to continue to grow with consumer demands. Nonwovens must be manufactured in a variety of finishes, and they must be bleached, dyed, printed, and embossed.

But it is the very area of finishing that provides nonwovens with an important advantage—second only to the inherent built-in flexibility that characterizes nonwoven manufacturing. By varying fiber content, resin type and its content, and altering mechanical processing techniques, an almost unlimited range of "styles" can be achieved, usually at a lower cost than for woven or knitted goods.

With these advantages in our possession, and a wide-open market before us, still another ingredient is needed if the industry is to achieve a substantial portion of its potential: The products must be aggressively ADVERTISED, PROMOTED, AND SOLD! ! ! Far too many executives in the industry today seem to be laboring under the delusion that "if you build a better mousetrap, the world will beat a path to your door." No doubt, the world still wants a "better mousetrap" but today you must first "get your foot inside the

*Continued on page 64*



View of one of Swift Spinning Mills' Duo-Cards from the rear or breaker card end (front or delivery card is at extreme left in photo). The DuoCard is made by joining two conventional cards which have been altered as shown in the close-up photo at top of opposite page. The tandem arrangement is said to provide increased production, quality upgrading, and waste reduction. Fewer neps, better cleaning, and greater elongation at break result in a smoother appearance of the finished fabric as well as a better hand, according to mill officials.

# Mill shatters carding limitations!

***2 cards in tandem make better sliver at 3 times usual speeds***

**Staff report**

RECENTLY Swift Spinning Mills, Inc., Columbus, Ga., unveiled a carding system that has dramatically upped cotton whiteness by a full grade, tripled production, and lowered nep count and reduced nep size. Swift's Otis Alston, general superintendent, conceived, designed, and developed the process and nurtured it to its present stage. "Somebody else," he says, "named it Duo-Card."

Swift has granted Saco-Lowell Shops, Easley, S. C., world-wide marketing license, which, according to Saco-Lowell's sales manager, J. W. Hubbard, will be done on a one-shot fee basis with S-L supplying the know-how and whatever parts are needed. Amortization time, varying from plant to plant of course, should be inside one year. This includes licensing fee.

"Our being offered the license," says Hubbard, "springs from 55 years of very close friendship between Saco-Lowell Shops and Swift Spinning Mills. We did not take part in its development."

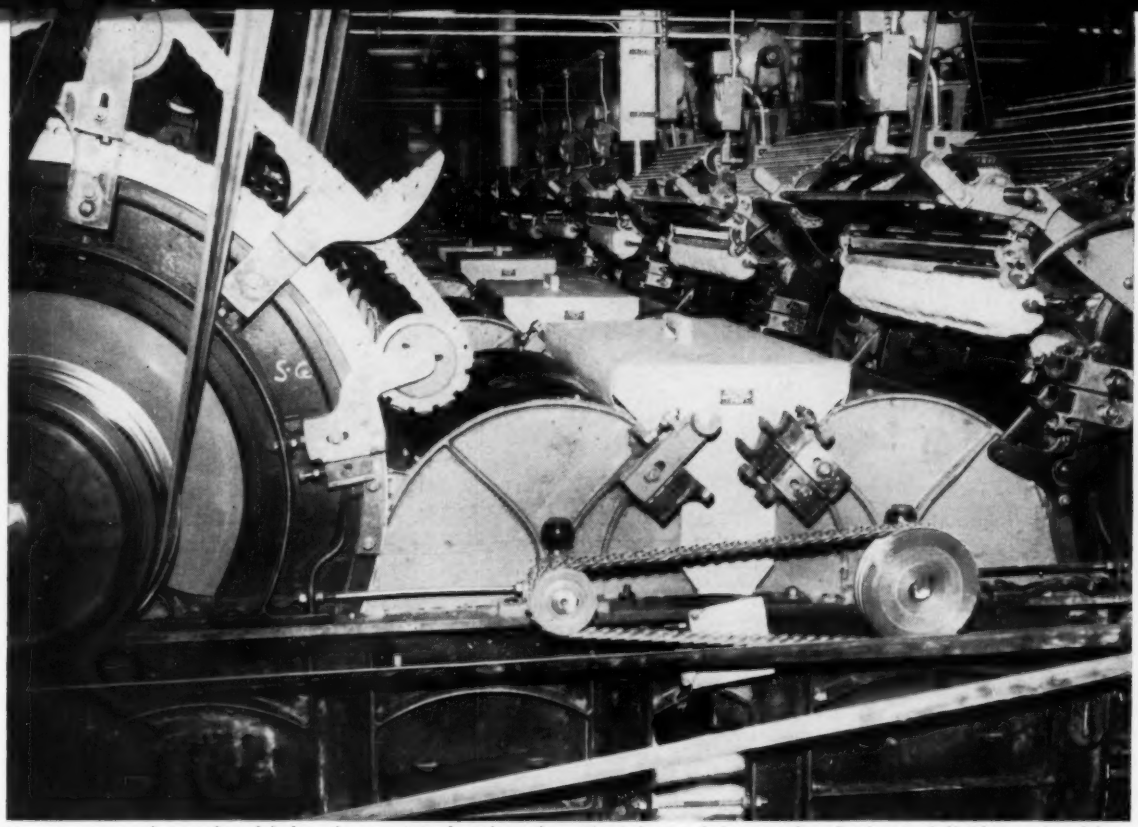
**What It Is.** Otis Alston's 26 years in the textile industry give him solid footing from which to appraise the processes that weigh, clean, draw out, and twist the millions of pounds of yarn his plant ships yearly. And for some reason even Otis Alston is unsure of, his thoughts kept turning back to those lines of cards that are charged with so much cleaning responsibility.

There millions of steel fingers snatched individual fibers from a flat sheet, flailed those little fellows across grid bars to knock loose the heavier trash, dragged them over a forest of flats wire to scrub off the "shorties" and such, and finally stuck them together again in a web that is subsequently coiled rope-wise in a can. However the card might smack of magic, it was slow—each 5000-lb unit was able to sort, clean, and reassemble only about 7 pounds per hour correctly.

Somewhere over the past century the industry had hit on a lucky combination that is today's card, found it an improvement over the wood-and-wire machines of antiquity, and had turned to more pressing problems. A card made 60 years ago does the same work its younger brother of yesterday is bought to do.

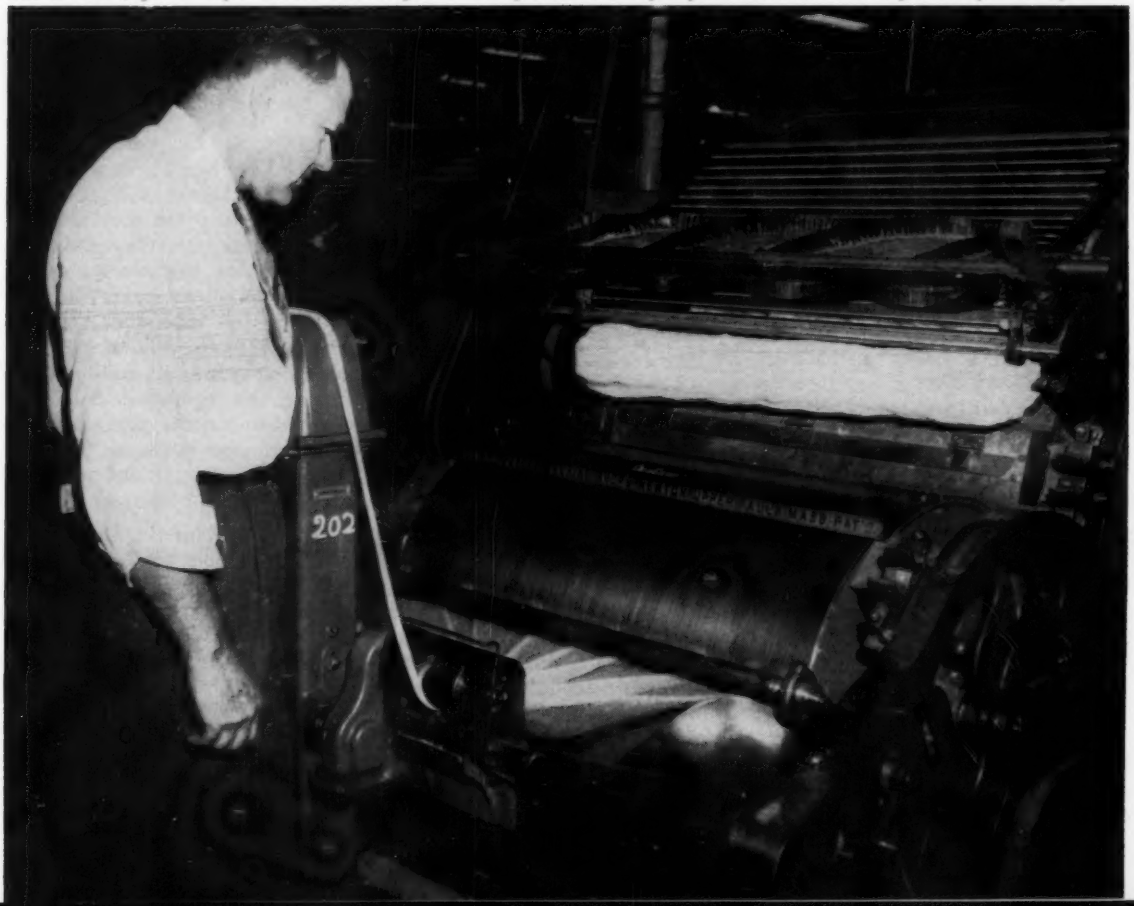
True, someone had hit upon the scheme of double carding certain stocks—if one carding improves quality, why not run the stock through twice? But that system required the sliver from one card to be made into a sort of lap for feeding into the second card. And each time the stock went through the harsh opening process, additional fibers got rolled into those devilish tangles called neps.

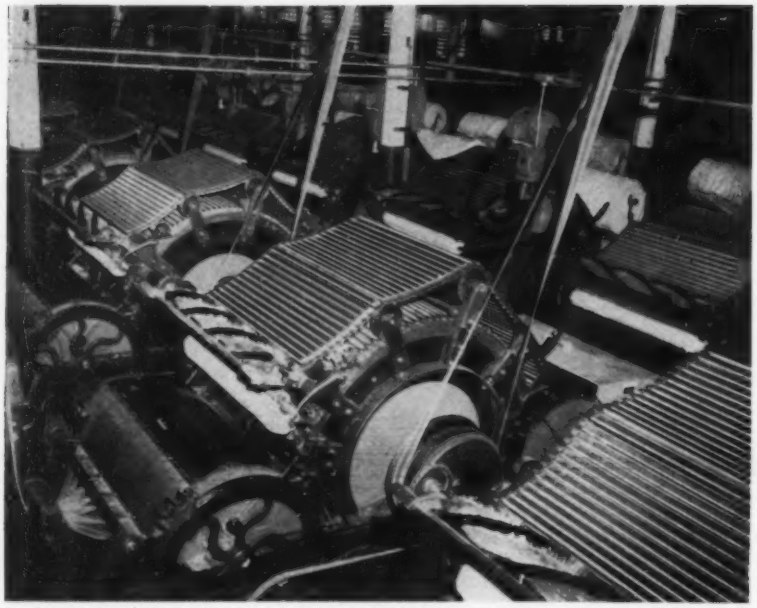
No one was really surprised



How the two cards are altered before they are joined to form the DuoCard is shown in this close-up photo. The front delivery section of the first or breaker card (right) is removed back to the doffer. The licker-in of the second or finisher card (left) is replaced by a doffer which provides continuous, high-speed transfer of the carded fibers to the second cylinder. Setting between doffers is 5/1000".

Inspecting the web delivered by one of the mill's 36 DuoCards is Otis B. Alston, general superintendent and designer of the system which is, according to President W. Frank Lowell of Saco-Shops, "the only major advancement in carding in nearly a century."





In this overhead view of the card room at Swift Spinning Mills, several of the DuoCards are shown. Floor space saved by the tandem arrangement allows for in-plant expansion.

when one morning Otis Alston unrolled a drawing before President Henry Swift. But the sketch staring back at him must have surprised President Swift. The superintendent had partly scrambled two cards, lost a part of both, and borrowed a part from a third. The remains were in tandem.

The rear card had lost its coiler and doffer comb; the front card had swapped its lap rack, feed plate assembly, and licker-in for a second doffer. The rear card was busily opening and carding in the usual manner, but it was passing its web, full width, into the first doffer of the second card. One lap, one licker-in, two cylinders, three doffers, one comb, and one coiler.

No one was really surprised when President Swift and Board Chairman A. Illges said, "Go ahead, Otis."

**What It Does.** It took Otis Alston only a short time to effect the union of the two cards, leaving only 5/1000" between the two doffers, but it took him and Swift Spinning Mills nearly eight years to say "We are ready to release the DuoCard principle." By then there were 36 sets operating in Otis' plant.

From the beginning it became apparent that stock from the DuoCard would require special handling in later processes to keep it separated from the regular production. Its whiteness and gloss would streak fabrics made of the same stock but coming through conventional carding.

Also apparent was the ease with which the second card, with little to do but refine the work begun by the first card, seemed to loaf along, either "untying" neps, shaking them out, or taking them down in size, and polishing the fibers.

When the present state arrived and the firm could take stock of its doings, there was no doubting the results—although the card production rate was three times "normal." While working at a speed long regarded impossible for quality work, the card produces 30 to 40 per cent fewer neps (smaller, too) than its less gifted brothers; takes out less total waste; burnishes the fibers a full grade brighter; and increases yarn elongation at the break.

As a final check on yarn appearance, Swift knits samples from both conventional and DuoCard systems, examines them critically under this severe test. The yarns "coddled" through carding at 7 pounds per hour invariably end up second to those brought through the newer system.

There are other less imposing advantages. The present sets have not been stripped in five months (metallic clothing is a must) and still don't need it. The card tenders periodically hold a hand brush against the finisher doffer to whisk away impactions there that could distort the web, etc. Twenty per cent less floor space is needed; and yarn counts fluctuate through a smaller range.

Card settings remain fairly consistent with the conventional system, still are made to control the same variables as always. Swift keeps flats set "as closely as possible." Each plant will work out a system unto itself.

**Who Can Use It.** An application for a patent on this process has been applied for, and anyone can use the process by paying Saco-Lowell the license fee, paid as a lump sum and not based on future use. Saco-Lowell will supply the know-how for setting it up and maintaining it.

Parts may present a problem in the beginning. Of course Saco-Lowell can supply parts for its own cards, but much of that business will go to machinery supply firms who own idle cards of the correct make. It will require installing metallic clothing, as conventional clothing will load too fast, for one thing.

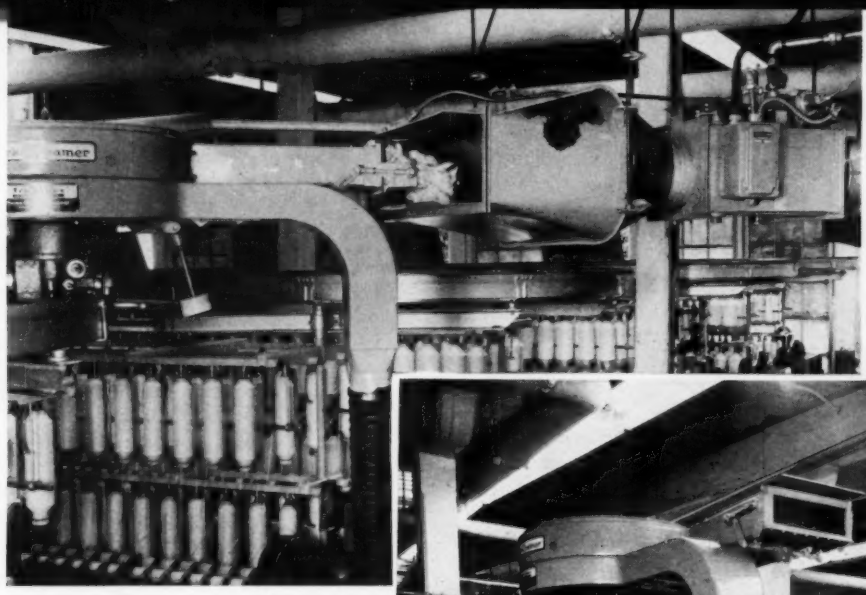
## Nonwovens

*(from page 61)*

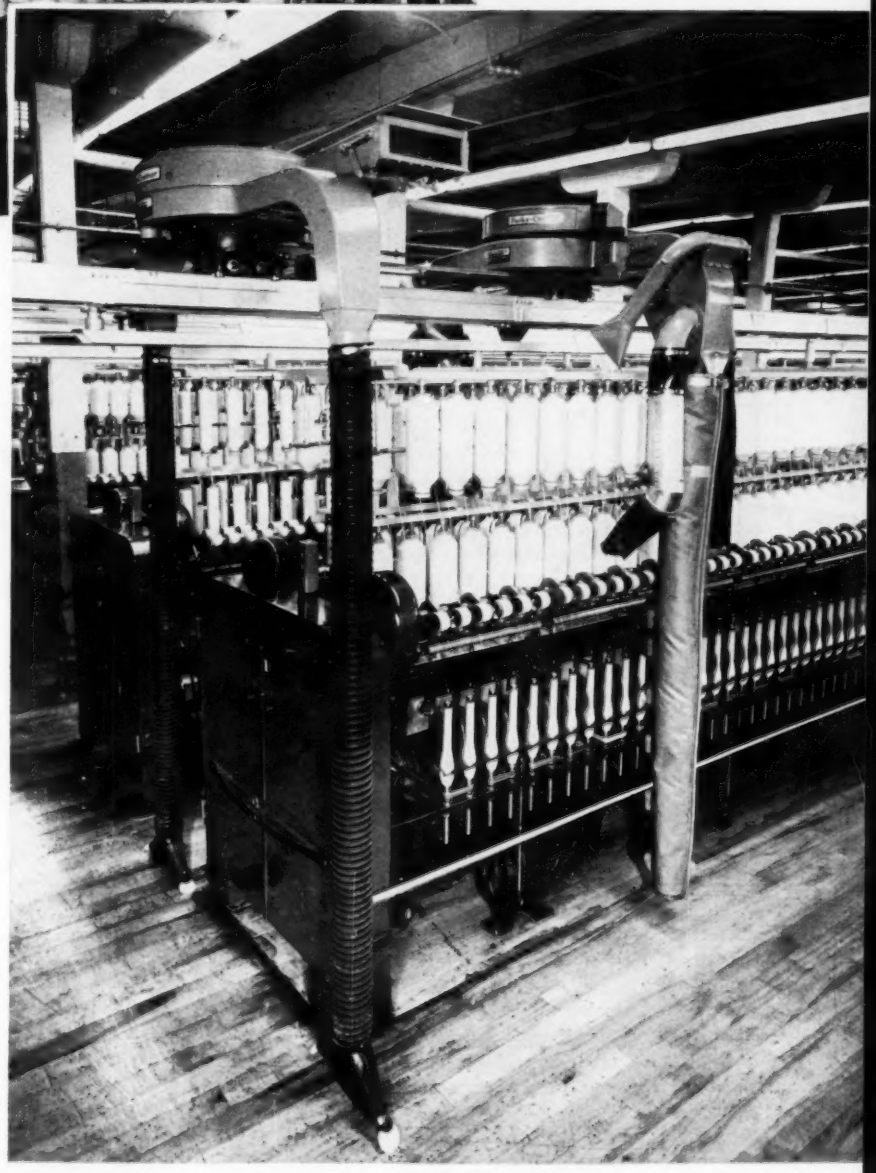
door" and then you must deliver.

Fortunately for the nonwoven bonded fabrics and batting industry, the products must still be sold. And the rules that apply in selling are essentially the same as those that apply in selling other textiles and products. All other factors being equal, there is nothing that quite takes the place of good, old-fashioned hard work and salesmanship.

*(Other articles in this series, which is to be continued in an early issue, are: "What nonwovens are and how they are made"; "Operating economics and production planning"; "Finishing of nonwovens"; "Production machinery —The fibers, the binders"; and "Dictionary of terms." — The Editors.)*



In midstride (left) a TravelVac unit hands off its load of floor sweeps to the waiting collection station. Sixteen such units work in tandem with TravelBlo cleaners (below) to reduce sweeping force to six men for the 64,248 spindles.



# BETTER YARN, CLEANER MILL

***American & Efird Mills' Albemarle, N. C., plant has automatic cleaners and sweepers on 64,248 spindles***

***Yarn imperfections have been reduced 20% with 30% less labor***

**Staff prepared Exclusive**

TRAVELING cleaners have helped solve a problem at American & Efird Mills, Inc., Efird Division, Albemarle, N. C. All spinning spindles at this division are equipped with TravelBlo (providing automatic ceiling and frame cleaning) and TravelVac (providing continuous floor sweeping with automatic waste removal). The units operate in tandem on frame-mounted Parks-Cramer CT track.

This fast moving, progressive mill has 16 TravelVac floor sweepers operating along with TravelBlo units, and there are six additional TravelBlo units operating in winding and twisting departments. All units have been in operation from 7 to 14 months with good results and have effected cleaner spinning with 20 per cent fewer ends down, figured on a conservative basis. There is less fly and lint in the air to circulate into spinning.

**Looks Better, Runs Better.** The mechanical cleaners accomplish the main objective of improving

Close-up of the sweeper's traveler cup.

quality, throw in labor saving as a bonus. Since the new cleaning equipment was installed, the improved yarn shows a 20 per cent reduction in imperfections, according to H. Wells Rogers, general superintendent.

The mill now looks better and cleaner with the improved housekeeping accompanying operation of the new traveling cleaners, and working conditions are improved. Absenteeism has been reduced.

Block creeling is done in Mills No. 1 and 3. Mill No. 1 runs 6s - 16s combed work; Mill No. 3 runs 16s - 40s combed. Rolls are cleaned manually when creeling is done. No roll picking is done.

The average creel now runs about one week. When larger packages are installed, a 40 per cent increase in running time of creel is expected, with no cleaning anticipated between block creeling interval.

An additional advantage permitted using 30 per cent less labor in spinning due to fewer ends down and less time required of spinners to do cleaning operations. Also, there is less demand on spinners anticipated in creeling operations when a 40-ounce package replaces a 28-ounce package now in the creels. The changeover in package size is now underway.

**"Blowing Down" Inadequate.** The mill formerly had overhead blowers blowing downward and upward to blow off frames and ceiling. The same tracks used for the old equipment are used for the new equipment, but it was braced and reinforced for the new units.

A decade or so ago, spinning frame cleaning was done manually or with simple traveling creel clearers to get the lint and fly off the frame and away from the spindles and yarn supply so it would not get into the work. This was accomplished by blowing the frames down and moving the lint toward the floor level.

With the widespread use of high speed spinning, long drafts, and with relatively short staple cottons some of the later years have produced, the lint and fly problems have been aggravated. Lint accumulations have increased from the drafting area downward on the frames and have become a detriment to quality or a costly operation to keep clean manually.

Simply moving the lint to floor level is no longer satisfactory because it accumulates quickly in large quantities, and air currents in the spinning room "boil" the lint back up and into the work.

Discounting the cost of bracing the track, the new equipment is expected to pay for itself within about one year. This does not take into account the noticeable improvement in quality evident in the yarn, which contains fewer imperfections as a result of the reduction in fly and free lint.

Air conditioning was installed, and machinery changes were made while the track was being braced. The track work was done under the supervision of a factory representative.

Yarns range from 6s to 40s combed and 6s to 24s carded. There are three mill units now. Two mills were connected by an additional structure, and the Woodlawn plant was moved from Mount Holly to be consolidated with the Albemarle units.

This added 10,368 spindles (36 frames). Now there are 64,248 spinning spindles comprising the Efird Division. Before the change there was no air conditioning. Mill No. 3 now contains 39,552 spindles.

TravelVac was installed over all spinning. Air conditioning and refrigeration were installed in Mill No. 3 during the change, making a worthwhile improvement in operations and working conditions. The remainder of the division will be completely air conditioned with 2,200 tons of refrigeration equipment already installed.

**From Eighteen to Six.** In the spinning departments alone, there were 18 sweepers employed full time. Manual sweepers patrolled with sweeper "ploughs" on a full-time basis. Now there are six sweepers to supplement the mechanical cleaners, and the entire spinning area from ceiling to floor is cleaner than it was when only manual sweepers were on the job.

The TravelBlo is equipped with a three horsepower motor directly connected to a self cleaning type fan. The sheet metal housing consists of a storage chamber and two arms to which floor level flexible sleeves with flared nozzles are attached.

The TravelVac floor sweeper straddles the spinning frames and operates ahead of the TravelBlo. Lint is drawn into the nozzles and stored temporarily in the compartment above. To compensate for floor level variations, spacer skids maintain correct distance between bottom of nozzle and floor. Collapsible nozzles facilitate uninterrupted travel of the unit. The overhead storage chamber is equipped with Teflon coated stainless steel filters.

Turbulence of the lint itself provides continuous internal cleaning of the filters and jets of compressed air, automatically turned on as unit approaches unloading station, provide external cleaning. As the TravelVac approaches its unloading station, a switch is depressed and the damper of the unloader station opens, allowing an inrush of air.

The TravelVac door is then opened by cam lever action, and stored lint is transferred to the waste removal portion of the system. The lint is then carried by vacuum to the separator at the central collecting point. Each track circuit has its own unloader to automatically convey the sweeps to the collecting point.

The only manual cleaning done now is that spinners clean thread boards and wipe spindle base and base rails once a shift. Head-end and rockers are brushed once every 24 hours by persons assigned to cleaning duties.

Personnel departments range from casual to elaborate, with the latter type being quite prevalent in northern-owned chains of plants. Personnel specialists are important in helping distant management communicate with all levels of management and labor.

# Are your PERSONNEL PRACTICES in line?

***Report on a study of the effect of 5 factors on personnel practices in 98 southern spinning and weaving mills***


**by H. Ellsworth Steele**
*Research professor in Economics*
*Auburn University*


**Exclusive**

SPINNING and weaving firms constitute a major element in the economy of the southern states.[1] Their relative importance in the region as producers and as employers has enabled them to set the general patterns of employer-employee relations, especially in the years past.

The fact that the individual plants are typically large, and frequently are the most important employer within the local community, has contributed to this result.[2] For these reasons an analysis of the influences which (1) mill size, (2) unionization, (3) personnel specialization, (4) company structure, and (5) the location of company headquarters (inside or outside of the South) have on personnel practices should be of considerable interest.

*Source of Data.* This study investigates the impact of those five forces on the use of important per-

[1]The spinning and weaving mills covered in this study come within the census classifications of yarn and thread mills, broad woven fabric mills, narrow fabric and small wares mills and dyeing and finishing textile mills. In 1950, 1955, and 1958, mills in these groups accounted for two-thirds of all employees in the textile mill products category. *Statistical Abstract of the United States*, 1957, p. 203, 1959, p. 211.

Southern textile firms as a group employed 17 per cent of the workers and produced 11 per cent of the output (measured by value) credited to all southern manufacturing in 1958. The South as used here and in this study includes Alabama, Arkansas, Washington, D. C., Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. Industrial Development and Manufacturer's Record, 1959 Edition of the *Blue Book of Southern Progress*, May, 1959, p. 11.

[2]See the very fine study of the textile industry in A Look at Georgia Manufacturing Industries, Emory Business Executives' Research Committee, *Studies in Business and Economics*, No. 9, Emory University, pp. 23-32.

TABLE 1

**Number of Persons Employed in 98 Representative Southern Spinning and Weaving Mills Classified by Size, Unionization, Personnel Specialization, Company Structure, and Location of Company Headquarters, 1958**

| Classification | Number of mills | Number employed | | | |
|---|---|---|---|---|---|
| | | Range | | Total | Per Cent of Total |
| | | Min. | Max. | | |
| All Mills | 98 | 65 | 11,000 | 89,734 | 100 |
| Size | | | | | |
| Large (500 and more) | 61 | 500 | 11,000 | 79,320 | 88 |
| Small (under 500) | 37 | 65 | 480 | 10,414 | 12 |
| Unionization | | | | | |
| Union | 16 | 114 | 11,000 | 28,353 | 32 |
| Nonunion | 82 | 65 | 3,200 | 61,381 | 68 |
| Personnel specialization | | | | | |
| Present | 86 | 65 | 11,000 | 86,477 | 96 |
| Absent | 12 | 125 | 550 | 3,257 | 4 |
| Company structure | | | | | |
| Multi-plant | 86 | 114 | 11,000 | 81,497 | 91 |
| Single-plant | 12 | 65 | 3,200 | 8,237 | 9 |
| Location of company headquarters | | | | | |
| In the North | 26 | 200 | 3,000 | 28,913 | 32 |
| In the South | 72 | 65 | 11,000 | 60,821 | 68 |

TABLE 2

**Characteristics of 98 Southern Spinning and Weaving Mills**

| Classification | Median number of employees | Are unionized (%) | Have personnel specialization (%) | Are part of a multi-plant firm (%) | Have company headquarters in the North (%) |
|---|---|---|---|---|---|
| Size | | | | | |
| Large | 975 | 21 | 97 | 93 | 33 |
| Small | 275 | 8 | 73 | 78 | 16 |
| Unionization | | | | | |
| Union | 1,075 | — | 94 | 100 | 38 |
| Nonunion | 550 | — | 87 | 85 | 24 |
| Personnel specialization | | | | | |
| Present | 689 | 17 | — | 92 | 30 |
| Absent | 235 | 8 | — | 58 | 0 |
| Company structure | | | | | |
| Multi-plant | 650 | 19 | 92 | — | 30 |
| Single-plant | 287 | 0 | 58 | — | 0 |
| Location of company headquarters | | | | | |
| In the North | 905 | 23 | 100 | 100 | — |
| In the South | 550 | 14 | 83 | 83 | — |

sonnel practices by 98 representative spinning and weaving mills located in the South. The basic information for the study, which was gathered by questionnaire in 1958, has been supplemented by correspondence and interviews with company officials. The mills[3] included employ approximately 90,000 workers and are located in seven of the southern states.[4] The number of mills which fall into the various classifications used in the analysis below and the number of employees involved in each case are presented in *Table 1*.

Before turning to an evaluation of the influence of the selected factors upon personnel practices, it may be useful to consider several methodological points. The possibility of failure in communication always must be kept in mind in a survey study.

This fact became clear in several of the interviews and led to extensive checking of results by correspondence. To minimize the influence of mistaken interpretations, and to simplify the analysis, only statistically significant differences are reported in this study,

[3]Throughout the study tabulations have been made on the basis of individual mills rather than by firms, many of which operate several mills. Individual buildings in the same town operated as a single unit have been treated as one mill.

[4]Returns were received from 61 per cent of the mills sent questionnaires. The responding mills are located in Alabama, Georgia, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia.

except in several cases concerning the use of Blue Cross-Blue Shield group insurance.

Attention also should be called to the inter-relationships among the five factors examined. The size of a mill, for instance, probably directly influences the personnel practices pursued. In addition, size will also have an influence on unionization and the use of personnel specialists, factors which, in turn, affect personnel relations. An examination of the data in *Table 2* will make clear many of these interrelationships.

## 1. Mill size

Greater size is apparently accompanied by greater elaboration in personnel programs. This relationship, as has been seen, may be direct or indirect. As *Table 2* shows, the large mills are more likely than the small ones to be organized, to have full-time personnel workers and/or an organized personnel department,[5] to be part of a multi-plant firm and to have company headquarters outside the South. In 17 of the 42 comparisons made in the study, statistically significant differences appear between the practices of small and large mills, as is revealed in *Table 3*.[6]

Large mills require a more complicated network of communications than do small mills because of the greater physical, economic, and social distances to be covered. Not only must officials of large firms make a conscious effort to maintain good communications within their plants, but they must also be prepared to meet greater outside demands for service than come to the small firms. Hence the significantly greater usage made of nine of the twelve communication practices covered in the study, as is reflected in *Table 3*.[7]

[5]Hereafter referred to as "personnel specialization."

[6]That is, it would occur by chance fewer than ten times if a hundred different pairs of samples of constant sizes were drawn from the same population. In 49 of the 62 instances in which significant differences are found, the level of confidence is 5 per cent or higher. Chi square has been used to determine the significance of the differences cited throughout the paper.

[7]The large mills did not make significantly greater use of safety programs, exit interviews or of records of exit interviews.

The emphasis which the large mills place on personnel specialization is a key element in explaining the differences in practice by mill size. "Labor is so expensive now," declared one mill superintendent interviewed, "that a company of any size can't afford to be without personnel workers."

The small mills get along without specialists, not because they have fewer problems, observed another superintendent, but because they have less-complicated problems. As mills grow, the supervisors eventually have to give up hiring their own workers. This change may come even sooner if company policy demands. But as long as the mill remains small, some managers interviewed positively prefer not to have "personnel men" in the plant.

It is quite natural for large mills with personnel men available to place more emphasis than do small mills on such factors as the use of tests, piece work or other incentive systems, training, suggestion plans, personnel research and use of outside consultants, nurses, and doctors (see *Table 3.)*

In the large mill the suggestion plan is especially valuable, as the personnel manager of a textile chain viewed it, because "A thousand people can see more than one person. The bigger the plant, the better the chance that workers can discover something that is worth while. In bigger companies jobs are bigger. Managers have less time to be thinking of changes. They rely on suggestion plans to furnish some of their thinking."

Large mills also use their personnel men to advantage in negotiating broader and more economical group insurance programs with the companies which provide the mill's workmen's compensation and other coverage. Hence, the tendency seen in *Table 3* for the large mills to shy away from Blue Cross-Blue Shield.

Personnel men stress their mills' good experience and sound administration of the programs to secure lower premium rates from commercial carriers than Blue Cross-Blue Shield offers. At least, this

**TABLE 3**

**Personnel Practices in 98 Southern Spinning and Weaving Mills Classified by Size**

| | Number employed | |
|---|---|---|
| | Under 500 (%) | 500 and more (%) |
| **Employment practices** | | |
| Use tests in hiring | 38 | 56** |
| **Wage and Salary and Related Practices** | | |
| Pay by piece rate or incentive system | 86 | 98* |
| Mills with a profit sharing program which includes hourly and clerical employees | 85* | 26 |
| **Communication and Related Practices** | | |
| Have full-time personnel workers | 70 | 95* |
| Have an organized personnel department | 73 | 89* |
| Have a training program | 54 | 82* |
| Post job vacancies for bidding | 8 | 36* |
| Sponsor a suggestion plan | 19 | 36** |
| Have a formalized grievance procedure | 51 | 74* |
| Unionized in part or in whole | 8 | 21** |
| Carry on personnel research | 73 | 90* |
| Employ outside consultants | 14 | 35* |
| **Employee Benefit Programs** | | |
| Provide a nurse and/or a doctor in the plant on a part or full-time basis | 32 | 70* |
| Mills providing a nurse and/or doctor | 8 | 34** |
| Mills with hospital expense insurance which have a Blue Cross plan | 41* | 6 |
| Mills with surgical expense insurance which have a Blue Shield plan | 36* | 2 |
| Mills with medical expense insurance which have a Blue Shield plan | 23* | 3 |

*Difference significant at the five per cent (or higher) level of confidence
**Difference significant at the ten per cent (or higher) level of confidence

". . . . Wider use of nurses and doctors by multiple-plants may be attributable to their greater size and more extensive use of personnel specialization. . . ."

is the belief of many spinning and weaving officials interviewed.

Blue Cross-Blue Shield, they contend, caters to the small mills by operating on national experience, a procedure which protects small firms from large premium increases should they suffer unusually adverse experience in any given year. Another factor in the large mills' predilection for commercial carriers may be the interest which managers in some large mills have in the insurance companies themselves. Such stock ownership may not only assure the mill favorable rates, but also may assure the particular insurance company that it will get the mill's business.

As inviting targets for union organizers—see the differences in extent of organization by mill size as shown in *Table 2*—large mills might be expected to make greater use of such union-favored programs as posting job vacancies for employee bids and formal grievance systems. With or without a union, however, large mills often find grievance procedures very helpful.

As one manager with 32 years of mill experience explained, supervisors frequently make mistakes which top management may not hear about until matters reach a dangerous state unless there is available some channel of communication like a formal grievance procedure. This manager would continue his present system, but without the arbitration step, even if his mill went nonunion.

The greater tendency for small mills (of those mills with profit sharing programs) to include hourly and clerical workers may be explained partially by the stronger possibility of unionization in the large mills. Big mills concerned over eventual unionization may seek to avoid negotiations over profit sharing by simply excluding hourly workers from their plans.

In contrast, small mills with their closer personal relations may be impressed with the advantages of including hourly workers in their profit sharing plans and may not be deterred by the possibility of unionization.

## 2. Unionization

As might be expected, a higher percentage of union than of nonunion mills are large, have personnel specialization, are part of a multi-plant firm and have their company headquarters outside the South, as *Table 2* indicates. Despite the reinforcing interrelationships involved, only in seven instances studied do the practices of the two groups of mills differ significantly.

The reluctance of organized firms to extend their profit sharing programs to include hourly and clerical workers has already been noted. *Table 4* shows that none of the union mills surveyed include these workers and few even include their supervisors. Evidently other company officials agree with the manager who commented that, "In the textile industry, when you get into profit sharing, you are taking the union into your management and that isn't desirable. Most people in textiles don't want anyone interfering with top management's ideas."

It may also be, as one superintendent complained, that unions force organized companies to put all their money into wages so that nothing is left for profit sharing.

As to differences in other practices, the top man in one mill declared, "In the unionized mill there are more problems, a million complications. Unions thrive on complicating your affairs. If they didn't, there wouldn't be a union."

From another point of view, however, union efforts to protect job rights and family income also might be seen in the differences in the use of job posting, formal grievance procedures, nurses, and doctors in the plant, and accidental death and dismemberment insurance, as reported in *Table 4*.

The interesting tendency for unionized plants to use Blue Cross-Blue Shield protection less frequently than non-union plants may well be traced to differences in size and use of personnel specialization by the two groups of mills.

## 3. Personnel specialization

Mills hiring full-time personnel workers or setting up an organized personnel department appear destined to have a more elaborate and sophisticated personnel program than mills which do not. Whether it is a projected program which requires the specialization, or the specialists who demand the expanded personnel program is not clear. Whatever the casual relationship, personnel specialization seems to have an important effect on the use of eighteen practices, as is shown in *Table 5*. In evaluating this relationship, it is well to bear in mind the association

**TABLE 4**

**Personnel Practices in 98 Southern Spinning and Weaving Mills Classified by Unionization**

| | Nonunion (%) | Union (%) |
|---|---|---|
| **Wage and Salary and Related Practices** | | |
| Mills with a profit sharing program which includes: | | |
| a. hourly and clerical employees | 61* | 0 |
| b. supervisors | 71* | 25 |
| **Communication and Related Practices** | | |
| Post job vacancies for bidding | 15 | 85* |
| Have a formalized grievance procedure | 60 | 94* |
| **Employee Benefit Programs** | | |
| Provide nurse and/or doctor in the plant on a part or full-time basis | 50 | 94* |
| Have accidental death or dismemberment insurance | 51 | 81* |
| Mills with hospital expense insurance which have a Blue Cross plan | 21 | 6 |
| Mills with surgical expense insurance which have a Blue Shield plan | 17** | 0 |
| Mills with medical expense insurance which have a Blue Shield plan | 11 | 0 |

*Difference significant at the five per cent (or higher) level of confidence
**Difference significant at the ten per cent (or higher) level of confidence

**TABLE 5**

**Personnel Practices in 98 Southern Spinning and Weaving Mills Classified by Personnel Specialization**

| | Personnel specialization Absent (%) | Present (%) |
|---|---|---|
| **Employment Practices** | | |
| Use application blanks | 58 | 97* |
| Use tests in hiring | 17 | 53* |
| **Wage and Salary and Related Practices** | | |
| Pay by piece rate or incentive system | 64 | 87* |
| Have a profit sharing program | 75* | 33 |
| Use employee rating system | 8 | 31* |
| Use job evaluation | 20 | 69* |
| Use seniority in promotion, layoff, rehire | 83 | 98* |
| **Communication and Related Practices** | | |
| Have a training program | 33 | 77* |
| Sponsor a suggestion plan | 8 | 33** |
| Mills having an exit interview program which keep records of the interviews | 33 | 92* |
| Carry on personnel research | 25 | 92* |
| Employ outside consultants | 0 | 31* |
| **Employee Benefit Programs** | | |
| Prepared meals available for employees | 8 | 45* |
| Provide a nurse and/or doctor in the plant on a part- or full-time basis | 0 | 64* |
| Have a disability income insurance program | 36 | 76* |
| Mills with hospital expense insurance which have a Blue Cross plan | 36** | 15 |
| Mills with surgical expense insurance which have a Blue Shield plan | 30 | 11 |
| Mills with medical expense insurance which have a Blue Shield plan | 43* | 3 |
| Have a credit union | 35* | 5 |

*Difference significant at the five per cent (or higher) level of confidence
**Difference significant at the ten per cent (or higher) level of confidence

of personnel specialization with greater size, unionization, multiplant firms, and company headquarters located in the North revealed in *Table 2*.

Once they are on the mill payroll, personnel specialists are apparently kept busy examining application blanks, giving tests, administering piece work and other incentive programs, advising on employee rating and job evaluation problems, directing training programs and suggestion plans, making records of exit interviews, carrying on personnel research, working with outside consultants, nurses, and doctors, supervising employee cafeterias, and administering disability income insurance programs.

At least significantly more mills with personnel specialization than without it have these programs. The roles of the personnel specialist in developing group hospital, surgical and medical expense programs through commercial carriers has already been discussed, but attention should be called to the data on these programs given in *Table 5*. There is, of course, the possibility that all of these differences noted are due to differences in size rather than in the use of personnel specialists.

The greater use of seniority by mills with personnel specialists is especially interesting in view of the fact that size and unionization both have apparently little influence on use of this practice in the mills studied.[8] Possibly many personnel men agree with the official in a nonunion mill who declared, "Most people have come around to recognizing seniority. It is job security."

The greater use of profit sharing programs by mills without personnel specialists might be traceable to the smaller size of these mills. In such mills closer personal relations between management and men might promote such sharing.

The only difficulty with this thesis is that a somewhat *lower* proportion of the small mills than of the large mills report profit sharing programs.[9] Similarly there is no ready explanation for the greater extent of credit unions among the mills without personnel specialization than in the mills

[8]Seniority was used in all of the small plants and in 95 per cent of the large plants. All of the nonunion plants reported its use, but only 95 per cent of the unionized did.

[9]Thirty-six per cent vs. 39 per cent.

**TABLE 6**

**Personnel Practices in 98 Southern Spinning and Weaving Mills Classified by Company Structure**

| | Single-plant (%) | Multi-plant (%) |
|---|---|---|
| **Employment Practices** | | |
| Request references | 75 | 95* |
| **Wage and Salary and Related Practices** | | |
| Pay by piece rate or incentive system | 73 | 96* |
| Mills with a profit sharing program which includes hourly and clerical employees | 83* | 40 |
| Use job evaluation | 17 | 71* |
| **Communication and Related Practices** | | |
| Have full-time personnel workers | 50 | 91* |
| Have an organized personnel department | 50 | 87* |
| Post job vacancies for bidding | 0 | 29* |
| Sponsor a suggestion plan | 0 | 34* |
| Mills having an exit interview program which keep records of the interviews | 67 | 88* |
| Unionized in part or in whole | 0 | 19** |
| Carry on personnel research | 58 | 87* |
| **Employee Benefit Programs** | | |
| Provide a nurse and/or a doctor in the plant on a part- or full-time basis | 33 | 59* |
| Mills with hospital expense insurance which have a Blue Cross plan | 38 | 16 |
| Mills with surgical expense insurance which have a Blue Shield plan | 29 | 12 |
| Mills with medical expense insurance which have a Blue Shield plan | 40* | 5 |

*Difference significant at the five per cent (or higher) level of confidence
**Difference significant at the ten per cent (or higher) level of confidence

**TABLE 7**

**Personnel Practices in 98 Southern Spinning and Weaving Mills Classified by Location of Company Headquarters**

| | Company headquarters | |
|---|---|---|
| | South (%) | North (%) |
| **Wage and Salary and Related Practices** | | |
| Mills with a profit sharing program which includes hourly and clerical employees | 61* | 0 |
| **Communication and Related Practices** | | |
| Have full-time personnel workers | 82 | 96** |
| Sponsor a suggestion plan | 15 | 69* |
| **Employee Benefit Programs** | | |
| Mills with hospital expense insurance which have a Blue Cross plan | 20 | 14 |
| Mills with surgical expense insurance which have a Blue Shield plan | 18* | 0 |
| Mills with medical expense insurance which have a Blue Shield plan | 11 | 0 |
| Have a pension plan (other than OASI) | 49 | 69** |
| Have a credit union | 11** | 0 |
| Rent company houses to employees | 50* | 27 |

*Difference significant at the five per cent (or higher) level of confidence
**Difference significant at the ten per cent (or higher) level of confidence

with specialization.

## 4. Company structure

Spinning and weaving firms made up of a number of mills tend to have more elaborate personnel programs than the single-plant firms. Of these categories, a higher proportion of these "multiple plants" are large mills, are unionized, have personnel specialists and have their headquarters in the North, as the data in *Table 2* confirm.

The degree of autonomy exercised varies considerably among the branch plants. Some local managers are responsible only to top corporation officials who visit only two or three times a year. In other mills even plant organization for production purposes is subject to orders from New England. Returns from the mills classified by company structure indicate that significant differences are to be found in the use of the thirteen practices reported in *Table 6*.

The greater need for emphasis on communication in large mills, especially those units which are part of a multiple-plant firm, is reflected in the emphasis in the multiple-plant mills on full-time personnel workers, organized personnel departments, suggestion plans, records of exit interviews, collective bargaining, and personnel research. The greater extent of unionization among the multiple-plants in turn may explain their greater use of job posting.

Single-plants make less use of references than do multiple-plants, possibly because their managers are sometimes so well acquainted locally that they feel references would be superfluous. Managers of some small single-plants do not see the need for piece rates or other incentive programs, whereas the "more progressive" officials in the multiple-plants ordinarily do, according to some multiple-plant officials interviewed.

The multiple-plants stress job evaluation more than single-plants because top management is further separated from the workers, and not knowing the people, tries to be as fair as possible by evaluating the jobs.

Greater coverage of hourly and clerical workers by single-plants with profit sharing plans than by multiple-plants with such programs may possibly be explained by the closer feeling between workers and management in the "locally owned and operated" concerns, as well as the lesser possibility of unionization. Wider use of nurses and doctors by multiple-

plants may be attributable to their greater size and more extensive use of personnel specialization.

The tendency for the single-plant, which is ordinarily small and without a union or a personnel specialists, to turn to Blue Cross-Blue Shield for hospital, surgical and medical expense insurance has already been examined, but attention should be focused on the data on usage found in *Table 6*.

## 5. Location of company headquarters

Refinements of personnel practice have ordinarily developed first in the older industrialized regions of the Northeast. Firms from this area establishing branches in the South might well be expected to bring some of these practices to their southern mills. If this is true, many differences in practice should be expected between mills with company headquarters located in the North and those with headquarters located within the South. From the data in *Table 2* it can be seen that the northern-owned mills tend to be larger, more widely unionized, more specialized in handling personnel problems, and more frequently part of a multi-plant firm, than are the southern-owned mills. For the great majority of the practices investigated, these four last factors seem to reinforce a tendency toward wider usage. Nevertheless, significant differences appear only in seven comparisons. Interestingly, in three of the instances—inclusion of hourly and clerical employees in profit sharing programs, use of Blue Cross-Blue Shield, and sponsorship of a credit union—greater usage is invariably associated with smaller, nonunion, single-plants without personnel specialization, as has been noted previously.

From *Table 7* it can be seen that the "absentee owners" located outside the region are distinctly less apt to include the hourly and clerical workers in their profit sharing programs than are the mills with headquarters within the South. On the other hand, the northern-owned mills are more likely to have full-time personnel workers and suggestion plans.

". . . . Greater use of company housing by southern-owned mills fits into the traditional picture of paternalism which is associated with industrial development in the region. . . ."

The importance of specialists located within each plant to help distant management communicate with all levels of local management and with workers is quite obvious. A suggestion plan also would seem to aid in communication.

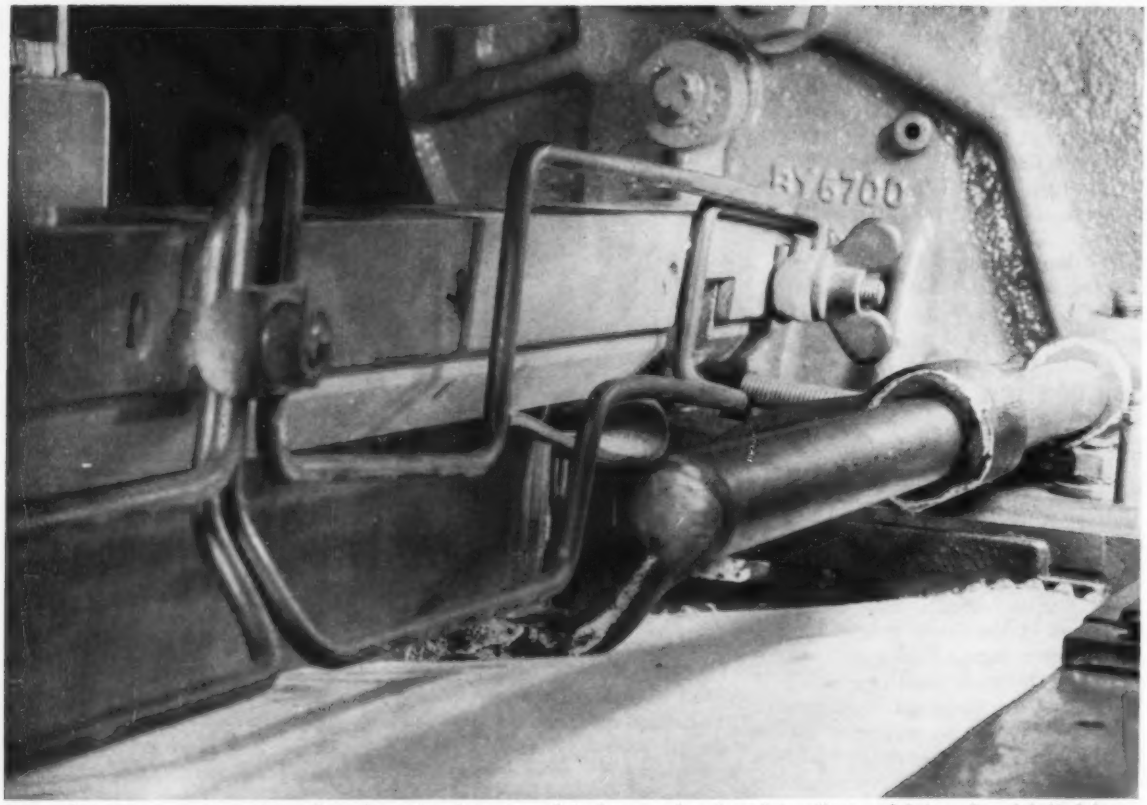
The tendency of the northern-owned mills to be large and to have full-time personnel workers would go far to explain their preference for commercial carriers of hospital, surgical and medical expense insurance rather than Blue Cross-Blue Shield. The same factors plus the greater development of pension programs in the industrialized North probably explain the greater use of pension programs by mills with headquarters outside the South. The wider use of credit unions by plants with headquarters in the South is yet to be explained. Greater use of company housing by southern-owned mills fits into the traditional picture of paternalism which is associated with industrial development in the region.

## Conclusions

From this survey, differences in personnel specialization and in mill size emerge as the most important of the five factors studied in their influence on the personnel practices of southern spinning and weaving mills. Differences in company structure are of lesser importance, but appear to have more impact than do differences in unionization and the location of company headquarters.

There is a strong tendency for large mills—which are unionized, have personnel specialization, are part of a multi-plant firm and have their headquarters outside the South—to use most of the practices studied more extensively than their counterparts. This tendency is especially true for the use of piecework and other incentive programs, full-time personnel workers, job posting, suggestion plans, personnel research and the employment of nurses and/or doctors for some in-plant service. For each of these practices, statistically significant differences appear in three or four of the five comparisons made.

An equally strong tendency is found for small, nonunion mills without personnel specialization, which are single plants and which have their headquarters in the South, to include hourly and clerical workers in profit sharing programs (if they have them), and to turn to Blue Cross-Blue Shield for hospital, surgical and medical expense insurance. The tendency for these mills to have profit sharing programs, to include supervisors in such programs, to sponsor credit unions, and to provide company housing is also present but to a lesser degree.




Battery lining-up gauge in position. Keep drop wires between pad in foreground and reed to offset reed being aligned behind boxes.

# GAUGES in Draper loom maintenance

***Why loom gauges are needed in the mill and how to use them***

***Article 12*—Keeping the transfer motion working correctly***

**Staff prepared Exclusive**

FROM the instant the feeler detects a bare bobbin until the transferrer pounds a fresh one into the shuttle, the loom has one whole rotation of the crankshaft in which to send forth the shuttle feeler, "cock" and ram the filling knife home, jam in a fresh package, and cut and extract the old filling end. Any dilute motion between feeler and filling cutting will eventually bring the fixer to grief.

Draper recommends the filling feeler to contact the bare bobbin with the lay 5/16" short of front center. The setting works fine on new parts and on looms equipped with the proper shuttles and the recommended feelers. Over the years, though, the fixer meets so many situations not in the book he is left wondering if anyone has the right answers.

One only has to study Draper's approach to this setting to see what Draper has done to assure correctness in the critical areas. For instance, Draper suggests the outside edge of the feelerguide be aligned with the center of the middle quill ring. That is not hard to see through; for one thing it keeps the feeler tip within a "safe" area on the quill.

Next, Draper suggests keeping

*Article 1 of this series appeared in the January, 1960 issue. Articles 2, 3, 4, 5, 6, 7, 8, 9, and 10 appeared in the February, March, May, June, July, September, October, November, and December issues respectively. Article 11 appeared in September, 1961. When the series is completed, it will be available in book form.

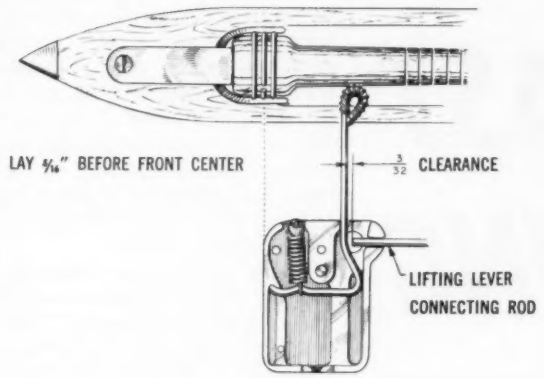



Figure 1

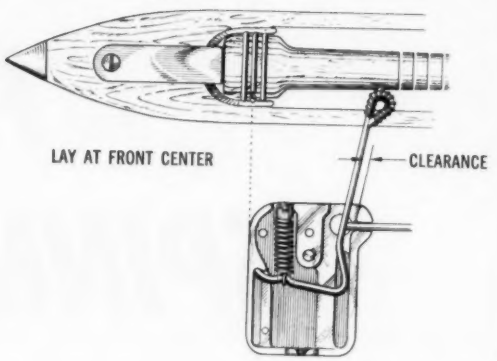
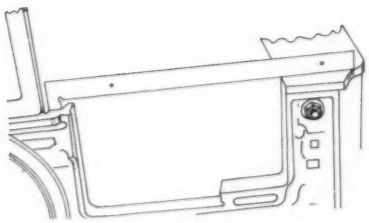



Figure 2



Gauge for "cross leveling" breast beam.

the tip of the quill slightly above the center line of the empty bobbin when the shuttle and bobbin are in place and resting on the lay end. If you are in doubt about this one, slide the shuttle as high in the box as you can force it and see where this positions the feeler tip. It's a cinch the shuttle is not going lower than the lay will permit, so this setting becomes perfectly general and quite sensible.

If your shuttles fly so high in the box they allow the feeler tip to slip much below the center line of the quill, then you are already in for so much trouble this little difference will hardly be noticed.

Also, the feeler assembly should be square to the lay. This is so obvious that it shouldn't require a second thought, but if you are in serious doubt that 90 degrees is the correct angle, check the running of a loom with this setting worked around out of place. It's a simple matter of mechanics, with the parts working best in this relationship.

Now look at *Figure 1*, taken from Draper's Setting Instructions Nos. 513 and 540. It is easy to see what a bit of wear inside the guide will do to the 3/32" clearance recommended between the lifting lever connecting rod and the feeler wire. While this clearance can be maintained by setting or bending the connecting rod loop to lengthen it, it won't matter one whoop if the feeler wire is allowed to flop around out of line to the left.

Eventually it will be trying to slide backward on the bobbin. That is the line that Draper has in mind in suggesting the assembly be kept at right angle to the lay. You may have to drift the guide slightly to the right, align it with the next ring toward the center of the loom, to keep this proper 90-degree relationship.

Another clearance is shown in *Figure 2*, but it is not restricted by a given distance. It merely suggests the feeler be kept from binding against the sides of the guide slot or against the end of the connecting rod. And this gives the fixer terrific freedom in making the setting. He now is free to move the lay to front center and adjust the clearance as shown.

This he can do even when the loom is fitted with off-center shuttles, with feelers of odd lengths and with assemblies reflecting different degrees of wear.

It is necessary to reconcile all the points just mentioned—feeler at right angle to lay, feeler tip slightly above bobbin center with the shuttle resting squarely on the lay end, and with enough clearance between feeler and connecting rod to keep the two from scrubbing as the full package keeps beating the feeler back into its slot.

And the fixer may have to do several retakes to get all the loose ends caught up. But trying to reconcile every exact measurement, every last bit of theoretical timing, becomes senseless the moment parts substitution and wear render such figures meaningless.

Here again, Draper has a point in giving such precise settings, for with the fixer destined to spend most of his time on the filling, transfer, and picking motions, one doubts the wisdom of forcing him to nurse along a batch of worn-out parts.

But the real expense attached to negligence here is in the form of the kinky filling, the slubs, the buttonhole selvages, the break-outs, and the shuttle smashes that inevitably show up in the cloth room.

But before the transfer motion can be adequately timed and set, there are position requirements, battery and lay, to be met. Fortunately, modern loom building renders this quite simple.

*(Continued next issue)*

# FAST SPINNING TEST

***Only 5½ hours and 2 pounds of roving are required to predict how a cotton will behave in the mill, says this progress report of development of an accelerated spinning end breakage test***

**by Gain L. Louis**
*Southern Regional Research Laboratory*[1]

**Exclusive**

THE spinning performance of cotton is evaluated mainly by its rate of end breakage per 1000 spindle hours. For a valid evaluation of a cotton, experience has shown that a minimum of 5000 spindle hours is needed (7).[2] These many spindle hours involve much material and time, and necessarily limit the extent of the possible evaluations. As a result, research laboratories find it difficult to conduct such types of "spinnability" tests routinely, since experimental samples are generally small and processing equipment is limited.

With increased emphasis being placed on: (a) new harvesting and ginning methods; (b) increased production rates; (c) newly bred cottons possessing more functional properties; and (c) development of chemically modified cottons, there is a real need for a procedure for rapidly evaluating the spinning performance of small samples of cotton in terms of end breakage.

Woo (10) approached the problem through statistics, while Burley (2) handled the problem on the basis that processing finer yarn numbers spun from the same cotton under the same organization and condition produces a greater number of spinning end breakages per hour. More practical and quicker methods are needed, however, so this study was initiated.

Spinning work reported in this paper was done on one side of a 72-spindle Saco-Lowell SS-2[3], 3½" gauge with 1¾" diameter, Number 1 flange rings. Spinning duration was 42 minutes per run.

IN THE SEARCH for a rapid spinning technique, many approaches were experimented with and tried, such as: (a) exerting external force on the portion of yarn between the front roll and the pigtail guide to evaluate the yarn's resistance to tension; (b) using different weight of travelers to obtain different tensions; (c) using double travelers to retard the speed of the travelers so as to create greater yarn tensions; (d) successively changing twist multipliers on a given yarn; and (e) varying spindle speeds to increase yarn tension.

These approaches individually did not yield good reproducibility, and sometimes different cottons reacted erratically. However, a combination of the latter two approaches provided the foundation for the present technique. Therefore, closer examination of these two approaches will give a better understanding of their applicability.

**Changing Twist Multipliers.** This approach consists of spinning selected yarn sizes using a series of low to high twist multipliers (keeping spindle speed constant) similar to the concept that developed the twist-strength curve for determining maximum yarn strength potential of cottons. That is, too much or too little twist will produce weaker yarns than yarns with optimum twist.

Similarly, it was found that soft or hard twisted yarns had more end breakages during spinning. Curve A in *Figure 1* shows that end breakages decreased sharply with relatively small decreases in twist when the same set of travelers was used throughout the test.

Curve B in *Figure 1* shows that the change in end breakage rate was relatively gradual when a new set of travelers was used with each successive twist multiplier. The order of spinning is indicated by the direction of the arrows.

The apparent disadvantage of using the same set of travelers for the test is that it provided too small a range of twist multipliers for sensitive evaluation between cottons, because the curve approaches zero so fast, and continues to dwell on the zero line.

On the other hand, though changing travelers (of same make and specifications) each time does yield reproducible results, the practice consumes much time. In

[1]One of the laboratories of the Southern Utilization Research and Development Division, Agricultural Research Service, U. S. Department of Agriculture.

[2]Numbers in parentheses are references at the end of this article.

[3]Use of a company and/or product named by the Department does not imply approval or recommendation of the product to the exclusion of others which may also be suitable.

FIG. 1. Relationship between yarn twist multiplier and end breakage in spinning, based on 18 spindles, 42-minute run.

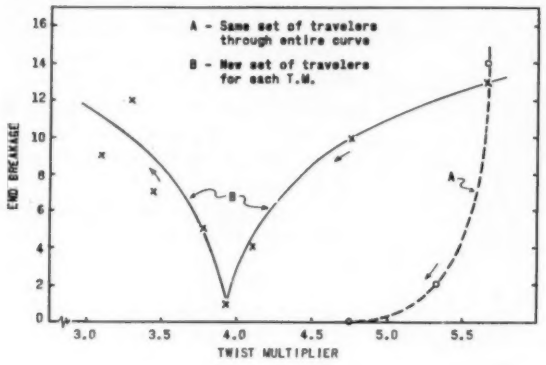



FIG. 2. Relationship between spindle speed and end breakage in spinning.

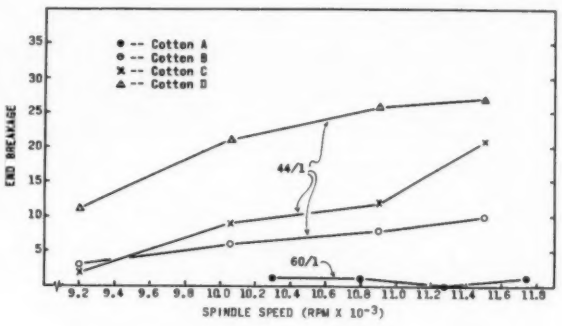
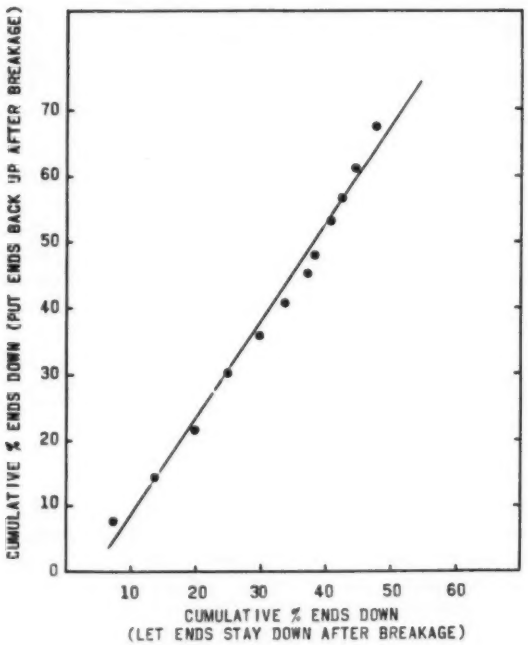
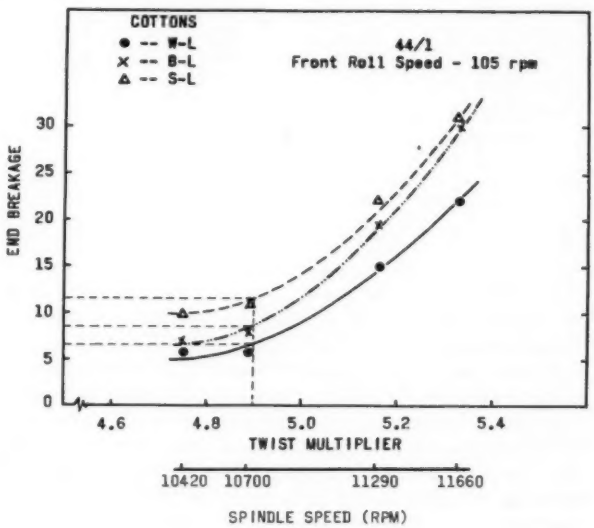



FIG. 3 (left). Relationship between two methods of handling end breakage in short-duration spinning tests.

FIG. 4 (below). Relationship between end breakage and twist multiplier (portion of curve).




either case traveler condition affects the amount of end breakage as evidenced by the difference between the two curves.

**Change Spindle Speeds.** This approach consists of spinning a given yarn number and twist (front roll speed varies accordingly) for a predetermined period at different spindle speeds. *Figure 2* shows some of the typical curves generated by this approach in spinning four different cottons. Seemingly, different cottons react differently to changing spindle speeds.

It is difficult to assess the relative spinning performance of cottons using this approach. Nevertheless, it was a rapid test.

Since the "change of twist" approach gave reproducible results, and the "change of spindle speed" approach was rapid to perform, these two approaches were combined in a spinning test which resulted in the present accelerated technique.

**Yarn Tension.** For simplicity and for the purpose of this work, spinning yarn tension refers to the component centrifugal force of the traveler acting on the yarn only (8), air drag and traveler frictional force are assumed to be constant from one run to the next.

Yarn tension is expressed in terms of grams per tex (centrifugal force in grams divided by the yarn size in tex system).

From a mill survey conducted by the Laboratory in 1954, it was found that the average yarn tension in spinning was about four grams per tex. This was confirmed by De Barr (3). However, yarns spun under normal tension require considerable time to accumulate a sufficient amount of end breakage for evaluation. Therefore, yarn tensions used in this study range from 6 to 14 grams per tex.

**Yarn Bobbin Position.** With the aid of a Uster Tension Recordograph, it was found that yarn tension between the front roll and

**Table 1. Control Data Used in Spinning Tests**

| | |
|---|---|
| Yarn number | 44/1 (13 tex) |
| Front roll speed | 105 rpm |
| Traveler size | Number 1/0 |
| Range of TM | 4.75 to 5.33 |
| Range of spindle speed | 10,390 to 11,660 |
| Spinning duration | 42 minutes per TM |
| Number of spindles | 36 (one side of frame) |
| Roving size | 3.25-hank |
| Ring size | 1¾" diameter |

**Table 2. Cotton Spinning Performances**

| Cotton | End Breakage[1] | Spindle Speed[1] (rpm) | Twist Multiplier[1] | Spinning Performance Index[2] |
|---|---|---|---|---|
| W-L | 0.1 | 9233 | 4.22 | 0.026 |
| B-L | 1.8 | 9277 | 4.24 | 0.458 |
| S-L | 2.3 | 9299 | 4.25 | 0.582 |
| W-M | 3.9 | 9452 | 4.32 | 0.955 |
| B-M | 7.4 | 9190 | 4.20 | 1.917 |
| S-M | 12.8 | 9255 | 4.23 | 3.270 |
| W-N | 3.1 | 9671 | 4.42 | 0.725 |
| B-N | 4.6 | 9649 | 4.41 | 1.081 |
| S-N | 4.5 | 9605 | 4.39 | 1.067 |

[1]Calculated values

[2]End breakage > 0, calculated by the formula:

$$\frac{\text{End Breakage}}{\text{Spindle Speed} \times \text{Twist Multiplier}} \times 10{,}000$$

the pigtail guide decreased linearly as the yarn builds up (filling wind) from empty to full bobbin.

Further experimentation showed that the decreased yarn tension due to changing of the position of the yarn on the bobbin decreased the amount of end breakage in spinning. Therefore, in this work the spinning for each test was initiated at the middle portion of the bobbin.

**End Breakage.** When spinning yarns under excessive tension, it is very laborious, time-consuming, and almost impossible to piece up the ends once they are down. The matter of piecing up a broken end or of letting it remain down after it broke was carefully examined when studying another spinning technique (2). In this study, a cotton was spun into four different yarn sizes ranging from 56/1 (10.5 tex) to 68/1 (8.8 tex).

Three one-hour runs were made for each of the yarn counts, constituting a total of 12 separate runs. The number of end breakages was recorded at five-minute intervals during which all broken ends were pieced up as they broke down.

End breakage data were sorted into two categories, one consisting of the initial end breakages and one consisting of the initial and repeated end breakages. *Figure 3* indicates that these two methods of handling end breakages in spinning are closely correlated, thus giving justification for not piecing the end after breakage. Furthermore, another advantage of this method is that it avoids the danger of counting repeated breakages caused by mechanical defects.

Based on the foregoing knowledge, the present spinning technique was developed.

# Procedure

In essence, the technique is based on the theory that the insertion of too much or too little twist in the yarn causes excessive end breakage in spinning. It calls for spinning selected yarn sizes in accordance with staple length of the cottons under higher-than-normal yarn tensions, using a series of low to high twist multipliers (spindle speed changes accordingly) while maintaining a constant front roll speed. The relationship between end breakages and twist multiplier can be described by a symmetrical upturned parabolic curve.

In applying this technique, certain basic factors must be arbitrarily predetermined. Things such as selecting a yarn size suitable for the staple length of the cotton being evaluated; front roll speed; yarn twist—the initial twist multiplier as well as the range and increment of twist multipliers; and spindle speeds. However, it is felt that much of the knowledge gained in twist-strength curve determinations is applicable for this work.

**Front Roll Speed.** Front roll speed varies with changes in either spindle speed or twist multiplier during spinning. The relationship of these three functions is as follows:

$$\text{FRS (rpm)} = \frac{\text{Spindle Speed (rpm)}}{\text{TM} \times \text{Yarn Count} \times \text{FRD}}$$

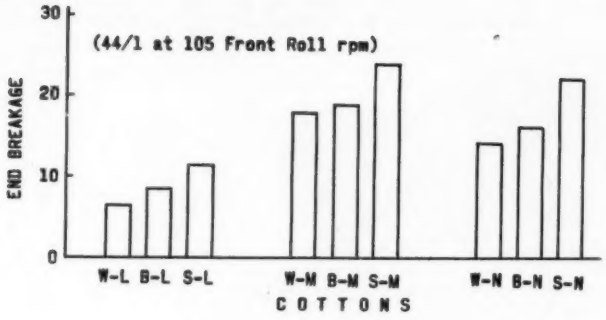
FRS = Front roll speed
TM = Twist multiple
FRD = Front roll diameter in inches

However, it is difficult to deal with three variables simultaneously, particularly in the final analysis of data. Therefore, it was decided to keep front roll speed constant for the following advantages:

a. To permit testing the same length of yarn per spindle.

b. To avoid inducing another possible variable—the different rate of fiber orientation at the drafting zone associated with changing of front roll speed (5). Normally recommended front roll speeds for given yarn sizes have been found to be suitable for this work.

**TM and Spindle Speed.** Spindle speed and twist multiplier are synonymous for a given front roll speed in that their actual numerical values differ only by a constant. Therefore, they may be used interchangeably for discussion and interpretation of the end breakage curve.



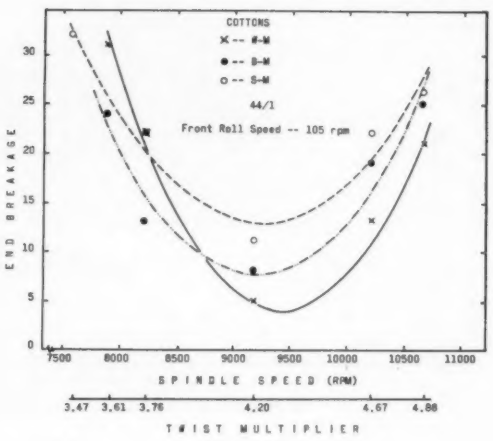




FIG. 5 (above). End breakage of nine experimental cottons.

FIG. 6 (right). Relationship between end breakage and spindle speed (full curve).

**End Breakage Curve Analysis.** In reality, the insertion of too little or too much twist in the yarn does not break the yarn, but increased yarn tension through increased spindle speed or other means exerts a force on the yarn sufficient to cause it to break. Therefore, one may interpret the cause of end breakage at the lower twist range as due to fiber slippage, while a shearing action among the fibers causes the yarn to break at the higher twist range.

**Twist Multipliers.** A minimum of five points is generally sufficient to define the end breakage parabolic curve. Although to date no precise method has been found to locate the twist multiplier for minimum end breakage before testing, limited experimentation showed that this twist multiplier lies in the vicinity of the twist multiplier for maximum skein strength.

Hence, it is advisable to pick other twist multipliers around it. Proposed methods (1, 4) for locating the twist multiplier for maximum yarn strength are applicable in this work.

**Yarn Sizing.** The yarn for sizing should be spun with a twist multiplier from the middle of the twist range selected for the test. Also, a lower front roll speed is used to insure minimum end breakage so that the available bobbin population (unbroken ends) will be at a maximum after the 15-minute run.

The slower front roll speed (10 rpm less than test run) enables the operator to piece up all broken ends during the 15-minute sizing run, which also serves as a warm-up run. The bottom portion of the bobbin should be used for this run so that, after sizing, the operator need only crank up the rail to the midsection of the bobbin to start the initial twist multiplier run without doffing the frame. This conserves time and still enables the yarn of the initial run to be wound on bare bobbins.

After the 15-minute run, sixty yards of yarn from twelve bobbins should be reeled and sized. It is important that yarn size be as close to the desired count as possible because yarn size will affect end breakage. Once the correct yarn is obtained, the twist gear for the smallest twist multiplier of the selected twist range should be put on to start the initial run of the test.

**Doffing.** The frame should be doffed after each twist multiplier so that each run will start with empty bobbins.

# Evaluation

The accelerated spinning technique was evaluated by its sensitivity, reproducibility, time consumption and size of test sample required. Evaluations were based on the three options which one may use with this technique to compare and evaluate the spinning performance of two or more cottons.

These are: Option 1, spin a portion of the end breakage curve; Option 2, spin the complete end breakage curve at the same front roll speed; and, Option 3, spin the complete end breakage curve at different levels of front roll speed. Each of the options has its own applicability as described below.

# Sensitivity

**Option 1.** This option is probably more suitable for quality control in a mill where lot to lot comparisons are needed. *Figure* 4 shows a typical set of curves using this option. Cottons used in this illustration were chosen because of their availability and suitability to demonstrate the application of this option.

This set of cottons consisted of three experimental cottons (code: S-L, S-M, and S-N), three white control cottons (code: W-L, W-M, and W-N) and three of their respective 50/50 blends (code: B-L, B-M, and B-N). These cottons were tested under the control specifications in *Table 1*.

Data interpretation is rather simple. For example, to find the amount of end breakages, at say 4.9 TM for the three cottons, one draws a vertical line from the 4.9 TM until it intersects all three curves. The point of intersection indicates the amount of end breakages of the cotton represented by that curve. *Figure 5* shows how these nine cottons rank in their end breakage under the conditions of Option 1.

**Option 2.** This option is prob-

FIG. 7. Comparison between results obtained by using Options 1 and 2

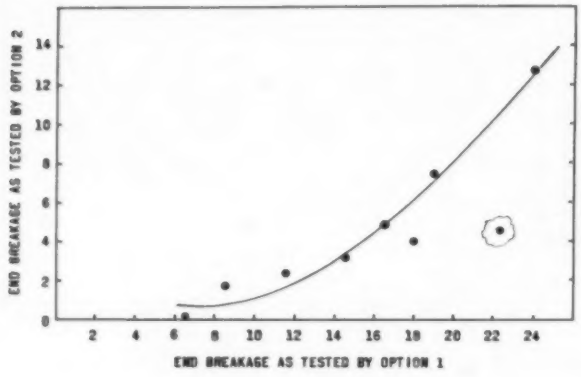
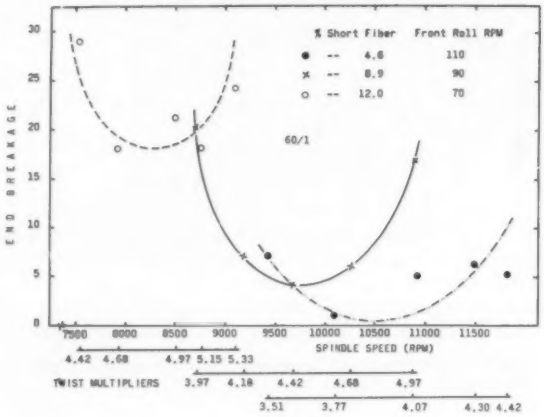



FIG. 8. Relationship between end breakage and spindle speed as well as twist multiplier for cottons spun at different front roll speeds.




ably preferred in research work where the knowledge of the characteristics of the entire curve is desired. *Figure 6* shows a typical set of curves using this option.

The same set of cottons used to illustrate Option 1 was used to demonstrate the application of this option. Similar spinning specifications were used as in Option 1 except that the range of twist multipliers was from 3.47 to 4.88 with spindle speeds ranging from 7,590 to 10,680.

Superficially, one can interpret this set of curves in the same manner as described in Option 1. However, it is felt that a more detailed analysis may be profitable, particularly if not all the minimum breakages occur at the same twist multiplier or spindle speed.

Tentatively, it is proposed that the spinning performance of cottons using this option be ranked by the magnitude of minimum breakage as well as its corresponding spindle speed and/or twist or the product of speed and twist. If two cottons have the same minimum end breakage, the one with the minimum end breakage occurring at the higher speed is the superior cotton.

*Table 2* shows the rankings of the above-mentioned cottons as tested by this option. The point of minimum end breakage may be obtained by first calculating the equation for the second degree polynomial curve (6) and then differentiating it to determine the twist multiplier or spindle speed for minimum breakage. Such was the case of the data in *Table 2*.

The spinning performance index is obtained by dividing the value of minimum breakage by the product of its corresponding spindle speed and twist multiplier (end breakage $>0$). The obtained value is then multiplied by 10,000 for easy handling of the index value. A smaller index value indicates a better cotton and vice versa.

A cotton tested under Options 1 and 2 will have different levels of end breakages. The curvilinear relationship of the data developed by the two options is shown in *Figure 7* (visually fitted curve).

**Option 3.** This is particularly useful in research when cottons being studied are suspected of having great differences in end breakages. This option accentuates the production advantage of this spinning technique. *Figure 8* shows the levels of end breakage for the three cottons having different per cent of short fiber contents (% of fibers ⅜" and less by weight).

For example, the lot containing 4.6% short fibers not only showed a much smaller minimum breakage value, but also showed a 20 rpm front roll speed advantage over the 8.9% lot, and 40 rpm over the 12.0% lot. These findings agree with results reported by Tallant, et al (9) whose data on spinning performance of this same set of cottons were based on a much larger number of spindle hours.

# Reproducibility

Limited data indicate that the technique has good reproducibility, but much more work is needed to validate these findings. Moreover, extensive work is needed to correlate data obtained from this technique with large scale spinning to establish proper levels of significant differences. Nevertheless, *Figure 7* indirectly depicts the good reproducibility of the technique, since data obtained from two different options corroborate each other.

# Time Consumption

Earlier experiments showed that the amount of end breakages tapered off rapidly after 30 minutes of running. The paucity of end breakages after 42 minutes of spinning time makes it hardly justifiable to extend the test duration beyond this point.

On an average, this technique requires about 5½ hours to test a cotton utilizing five points on the end breakage curve. This is considered rather fast.

# Size of Test Sample

About two pounds of roving are required to test a cotton by spinning a 44/1 yarn with a front roll speed of 105 rpm for five different twist multipliers on 36 spindles.

*Continued on page 96*

by Norbert Lloyd Enrick*

## *Article 8—Evaluation of selling operations*

### Exclusive

WITH THE large cost savings and profit improvements attained in many mill operations through industrial engineering and statistical and economic analysis, it is not surprising that the question has been raised: Can one use these analysis techniques to accomplish similar improvements in sales operations?

At this time, work is under way in several organizations, who feel that the answer to the question is a most emphatic "yes!"

**Problems of Sales Management.** In managing a sales organization, many important questions come up, which require critical analysis. For example, how many customers should a salesman normally visit during a week? How should the sales force divide its time among the various types of customers and the various types of service? Are branches located suitably?

Such types of questions are summarized in what is probably by no means a complete listing in *Table 1*. The answers will vary for each selling organization, and it is doubtful whether anyone can develop a final and all-inclusive solution. However, analysis of patterns and trends from past sales records will often yield valuable guidelines to future action, policy, and decisions.

**Value of Past Data.** Information concerning past sales volumes, types of customers served, and types of fabrics sold can be obtained readily from existing data. Usually, information of the type shown in *Table 2* will be of considerable value in realizing the existing pattern of customer reactions to past sales policies and procedures.

Yet, while the basic information exists in the company records, it is often not compiled in such a manner as to reveal the specific points raised in the list of *Table 2*. Use of punched cards and electronic data processing equipment will provide the pertinent information at rela-

**TABLE 1. Problems of Sales Management**

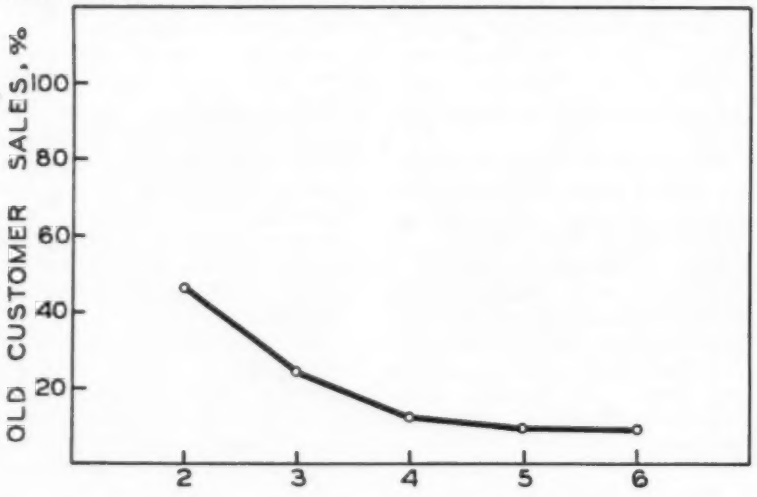
1. How many customers should a salesman visit during a week?
2. What is the proper breakdown of customers to call on, such as cutters, cutter-retailers, jobbers, exporters, and others?
3. What proportion of calls should be on:
   a. prospective new customers?
   b. old customers for repeat business?
   c. service calls?
4. What is the best number and location of sales branch offices?
5. How does head-office effect reflect itself through additional branch-office sales?
6. What measures of over-all effectiveness shall be used in evaluating sales operations?

*Associate Professor, University of Virginia Graduate School of Business Administration.

**TABLE 2. Information on Sales Patterns Obtainable from Past Sales Data**

1. Volume of sales by dollars, yards, and pounds by
   a. Months over the past several years,
   b. Selling seasons over the past several years,
   c. Type of customer, including such items as cutter, cutter-retailer or jobber, type of trade serviced, method of distribution, and price range,
   d. Type of fabric, including class, line, item identification, and other similar groupings considered pertinent.
2. Proportionate share of sales by various branches as compared against head-office sales.
3. Gain rate at which new customers are acquired.
4. Loss rate at which old customers stop purchasing, by season and location.
5. Maintenance of old customers in terms of numbers, dollar volume, and yardage.
6. Costs and expenses versus income for various types of customers and fabrics, broken down by head-office and branch operations.

FIGURE 1. Successive seasons of repeat business—note that fewer than 50 per cent of the customers bought in two successive seasons, and less than 30 per cent bought in three.




tively low cost.

The information revealed can be quite shocking. For example, in one instance it was discovered that a company had a rather sharp loss rate of customers, with fewer than 50 per cent of the customers buying in two successive seasons, and fewer than 30 per cent buying in three seasons on a repeat basis (see *Figure 1*). It was only the development of new customers, which kept the over-all level of sales at a satisfactory volume.

Once this information was brought to management's attention, steps were taken to investigate the causes of these high customer losses. It was felt that, if these losses could be cut, a considerable growth rate could be expected for the over-all business.

**New Data.** While past data are valuable, steps towards marked improvement will usually require additional information. New data will be required, often not available from existing record procedures.

Probably most often the type of documents needed are salesman's call reports, in which information is provided concerning the following:

1. Name and location of customer
2. Type of business (manufacturer, jobber, etc.)
3. Person seen
4. Length of call
5. Result of call

From these call slips, one can readily determine the average number of customers seen by each salesman. Deviations from standard can be noted. Information which previously only the salesman had, such as why a customer is re-ordering or why another customer is failing to purchase goods this season, can now be summarized for management.

The summarized results can be reviewed in relation to the questions raised in the list in *Table 1*, supplemented by the information from *Table 2*.

**Management Action.** Using the information available, management is now in a position to guide salesmen in their selling and service efforts, with the factual data on hand to back up its advice. Moreover, decisions concerning sales and pricing policies, branch offices, sales incentives, call rates, and other related matters, can be made with greater assurance.

It should be emphasized that, unlike mill operations, the analysis of sales operations has only begun to be undertaken in a few organizations. Yet, the results to date would seem to indicate that considerable gains in selling effectiveness, accompanied by reduced costs and enhanced over-all profits, are indeed attainable.

***Article 9, to appear in the November issue, gives an optimum lot size formula for balancing set-up and inventory costs.***

Some of the 1200 participants in the recent Southern Industrial Relations Conference at Blue Ridge, N. C., take a break between meetings.

# Seek perfection in production

***Jefferson Mills' head urges industrial personnel and training directors***

**Staff report**

A RECORD number of representatives (nearly 1200) at the 42nd annual Southern Industrial Relations Conference heard Morris Bryan, Jr., president of Jefferson (Ga.) Mills, Inc., emphasize that the United States faces an entirely new economic world in which world trade is the balancing factor.

"If American industry does not act (through efficient production) to compete favorably in world trade, Communism will bury us with unemployment, loss in national productivity, and wealth," he indicated.

"At Jefferson we found we could cut costs 55% if we used perfection as our goal, and our last check showed we had saved 20%. We are working to save more.

"Each of us can save this nation by exploiting three areas of effort: (1) set perfection as our standard of production; (2) learn the process of continued adult education so we can alert our people to our problems; and (3) tap the relatively unexplored field of motivation, for there is no growth except through self-growth," he concluded.

Frank L. Robertson, training supervisor, the Chemstrand Corp., told the group that management needs a sound basic philosophy of training supervisors. His company gets supervisor candidates from (1) college graduates, (2) promotion within the company, and (3) from other businesses.

Chemstrand's supervisor training program includes the three phases of familiarization, job knowledge, and development. Company needs further dictate covering human relations, policy, labor legislation, and general supervisory practices.

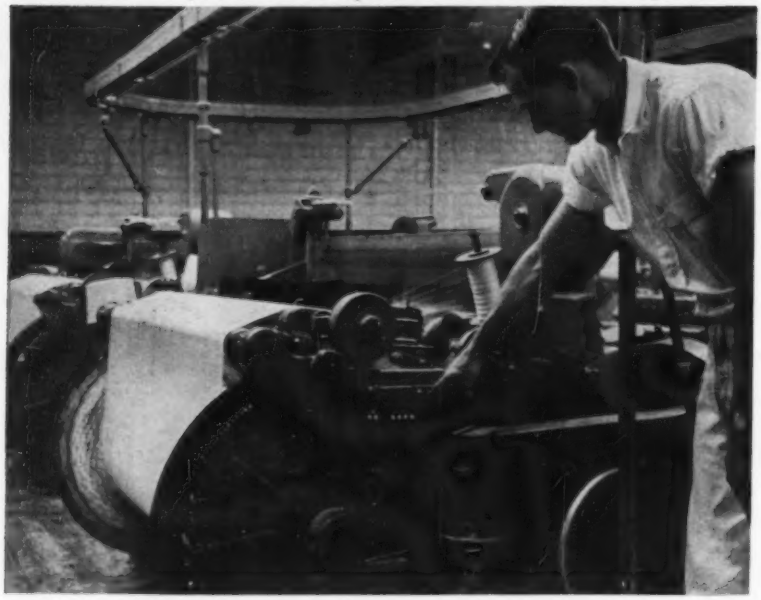
In all, twelve prominent speakers addressed the group on various subjects affecting human relations in industry. Senator Goldwater, R-Ariz., gave the opening address.

"There are forces at work right now that can so burden our economy that we may never get out from under the weight . . . " he said.

"What the country needs to do to get sound economic progress is to balance the budget. . . . "

Among directors of the Southern Industrial Relations Conference are: *James Byars,* Reeves Brothers Corp., Columbus, Ga.; *Morris M. Bryan, Jr.,* Jefferson Mills, Jefferson, Ga.; *J. C. Cowan, Jr.,* Burlington Industries, Inc., Greensboro, N. C.; *Erwin R. Lehman,* West Point Mfg. Co., West Point, Ga.; *John Marshall,* Rock Hill Printing & Finishing Co., Rock Hill, S. C.; *W. Gaines Huguley,* Burlington Industries Cotton Mills, Greenville, S. C.; *T. M. Forbes,* Georgia Textile Manufacturers Association, Atlanta, Ga.

Each loom has 28 injectors, and each injector meters the oil to the bearing it services.



# Loom lube

***Jefferson's DSL central lube system oils all points automatically, wastes no oil, damages no cloth, uses only one weight of lubricant, relieves full-time oiler***

The low-pressure drum pump has required little attention since its installation, is given periodic checks. The control panel, on wall behind drum, houses brain, nervous system.

## Exclusive

BY REPLACING fewer than one-fourth its old looms with new, automatically lubricated shuttleless models, the Jefferson Mills, Inc., Jefferson, Georgia, saves 6000 maintenance hours annually. This represents the equivalent of one worker a shift, three shifts a day, five days a week.

"It's no secret that lubricating had become a problem with the old looms." reports Hollis Ray, weave room supervisor. "The oil can simply could not reach certain points while the looms were in operation. So we waited until they were stopped for warp changes before adding lubricants. As a result, some parts did not get oil for ten days to three weeks at a time.

"This is obviously not the proper amount of lubricant at the proper interval, and cut down on loom efficiency, of course." "Also," Ray added, "we were using a light oil for open bearings and a heavy oil for gears and cams which added to our costs."

**Production Up. Costs Down.** Since the shuttleless looms were installed about two years ago, production has climbed and costs have dropped. Operating at 260 picks per minute, the new looms are 41 per cent faster than the conventional type. Moreover, they use 16 per cent less power per pound of goods, both because they are new

# time cut 6,000 hours a year

and because the lubricating system helps maintain their precise timing.

Downtime formerly needed for repairs and lubrication has been virtually eliminated. Oiling in just the right amount is now accomplished while the machines are in operation. And, of course, they need fewer repairs compared to the 20- to 30-year old looms they replaced.

As a result, loom maintenance costs have dipped one-third because of fewer breakdowns. Lubricant costs are down, too. Instead of two different kinds, now only one is needed. Oil damage to goods at the loom, though slight in the past, has now completely disappeared because the lubricant is fed to all bearings through sealed lines.

**Central Oiling System.** The automatic lubrication system, manufactured by Lincoln Engineering Company, St. Louis, Missouri, is standard equipment on all Draper shuttleless looms. This system became part of Jefferson's No. 3 weave room operation from the day the shuttleless looms were installed.

The lubricant injectors were already in place on that day. At first, Lincoln put in temporary pumps to supply each loom with lubricant as soon as it was in and running. Now, a Model 1826 low pressure CentrOmatic drum pump is located in the napper room, just below No. 3 weave room.

The pump draws oil from a 55-gallon refinery drum at 45-minute intervals. "With each 45-minute cycle we are certain that our looms receive a predetermined amount of lubricant with a regularity expected to lengthen their lives," Ray explained. "And," he added, "most important to the efficiency of our weaving operation, lubrication is now completed without slowing or halting production."

The pump is connected to a master control panel that contains an eight-hour adjustable time clock and an alarm signal that sounds if the drum runs dry or a line breaks.

When the pump is in operation, lubricant is fed through a single supply line suspended underneath the floor. It feeds lines that come up through the floor and connect to the 28 injectors on each loom. There is no return line because the system is designed so that each bearing receives the *exact* amount of lubricant it requires. Consequently, there is no excess to return.

Each injector has an adjusting knob that determines the amount of lubricant to be shot into the bearing it services. Adjustments are simple. They are made by turning the adjusting knob clockwise from a theoretical zero to 0.0025 of an ounce per cycle. Naturally, the larger the bearing the more lubricant desired. Lincoln representatives set these adjustments when the automatic system was installed.

The new 46-inch Draper DSL-3 shuttleless looms have been set up in No. 3 and No. 4 weave rooms. All the looms in No. 3 are lubricated entirely automatically, while the system serving the looms in No. 4 is fed via hand pumps. "Eventually," Ray stated, "we expect to make these automatic as well."

As he sums it up, "The automatic system does a better job than the hand-wielded oil can; has been a prime factor in reducing maintenance costs, and is expected to keep them reduced in the years to come."

Hollis Ray, weaving supervisor shown also on opposite page, sets the alarm cycle time. This sends oil to looms at 45-minute intervals, develops hysteria if supply fails or line breaks.

Accotex NO-471 is available in 60-, 100-, or 150-foot rolls, .083" thick. Two-inch width is standard (shown enlarged below); other widths available.

# NEW
# NEW

## "cloth-embossed" loom take-up roll covering gives high tension, superior fabric control

ACCOTEX IS A REGISTERED TRADE-MARK OF ARMSTRONG CORK COMPANY



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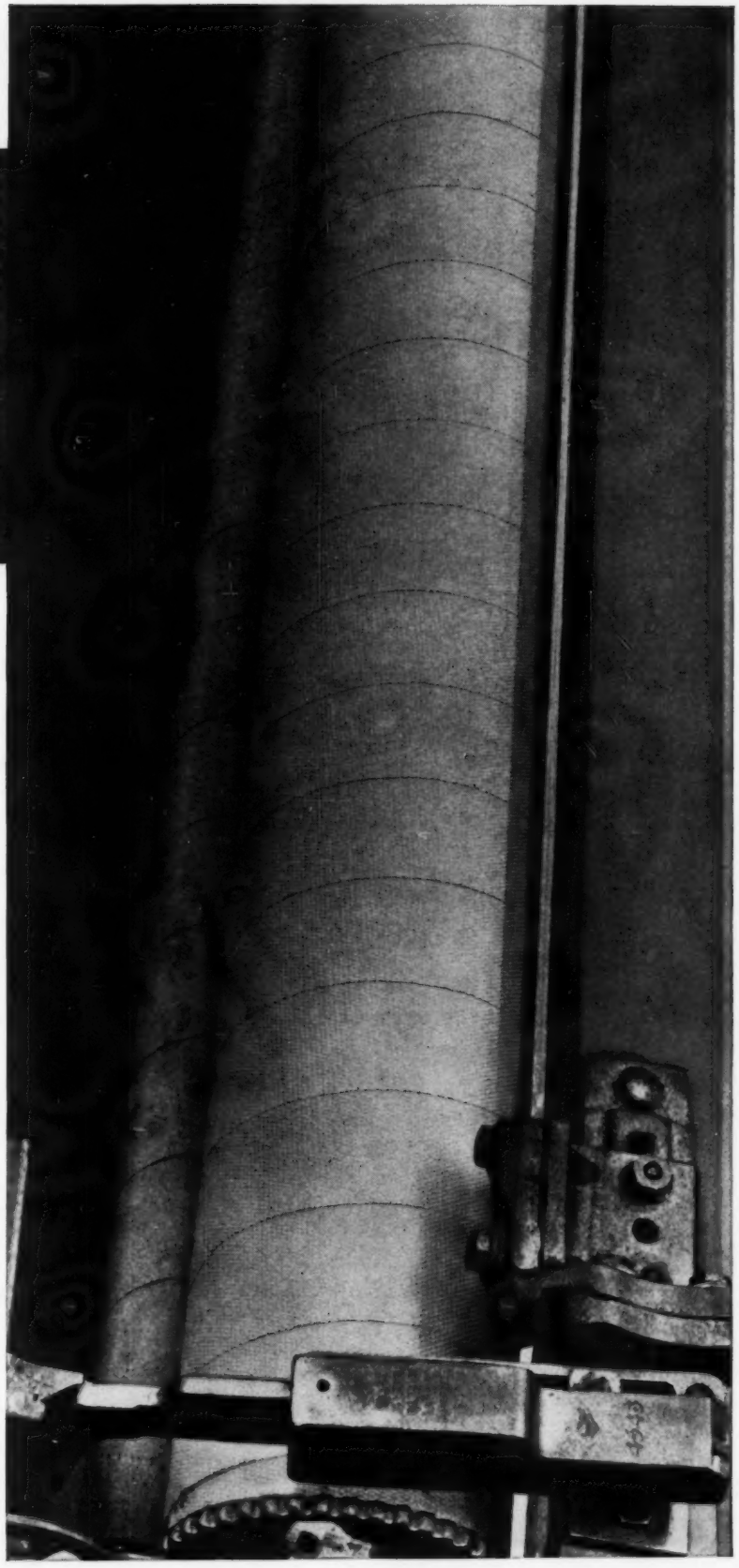

Here is a new take-up roll cover with a gripping surface that "keys" itself to the fabric to provide superior control. It's Armstrong Accotex NO-471.

This unique material is embossed with a specially woven cloth, whose imprint forms the gripping surface. The result is unusual holding power.

Accotex NO-471 is recommended for heavy-duty service on looms where sheeting, broadcloth, and similar fabrics are being woven. Its high-friction surface delivers excellent take-up tension, helps to eliminate cloth slippage.

Special rubber compounding gives NO-471 unusual abrasion resistance. It's as long wearing as it is efficient. Why not try NO-471 on your own looms? Your Armstrong man will be glad to arrange a test. Call him today or write Armstrong Cork Company, Industrial Division, 6610 Ivy Street, Lancaster, Pennsylvania.

**Armstrong**

**LOOM SUPPLIES**

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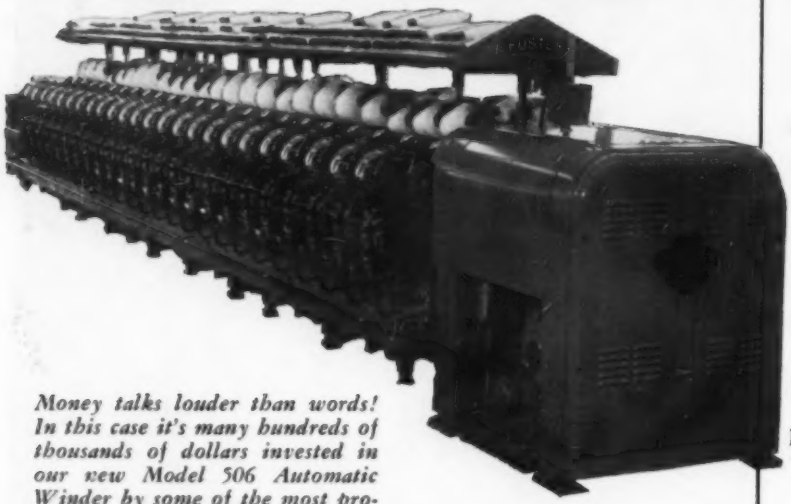
## *AUTOMATIC CONE WINDER*



*Money talks louder than words! In this case it's many hundreds of thousands of dollars invested in our new Model 506 Automatic Winder by some of the most progressive mills in the country. We ask for no better endorsement. Do you?*

*Some of the mills who are now using it or have placed orders for it.*

Linn Mills Co.
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Seaford, Md.

*These companies have ordered our Model 510 — another version of the 500 series.

## 50% MORE PRODUCTION PER OPERATOR AT TWICE THE WINDING SPEED WITHOUT JEOPARDIZING YARN QUALITY –

ELECTRONIC TENSION AND SLUB CATCHER

AUTOMATIC SIZE STOP MECHANISM

AUTOMATIC SUPPLY BOBBIN EXCHANGER

— that's why these mills have ordered. They want more production at lower cost, but they cannot afford it at the expense of yarn quality. The Model 506 *protects* yarn quality because it does not attempt to tie knots automatically. The operator does it with a standard high speed knotter and has an opportunity to test the knot at the same time (taking a small fraction of a minute). Thus any chance of wild yarn, tangles, bobbin rings, crossed ends, uneven package density or rough yarn (which can occur with automatic knot tying) is eliminated.

**AUTOMATION** is confined to threading up, slubbing, cleaning, disposal of empty bobbins, gauging full cones, donning full bobbins and doffing empty bobbins. None of these operations can jeopardize yarn quality.

**CONE QUALITY** is even better than that of the Model 102 cone (standard for the sales yarn market for many years).

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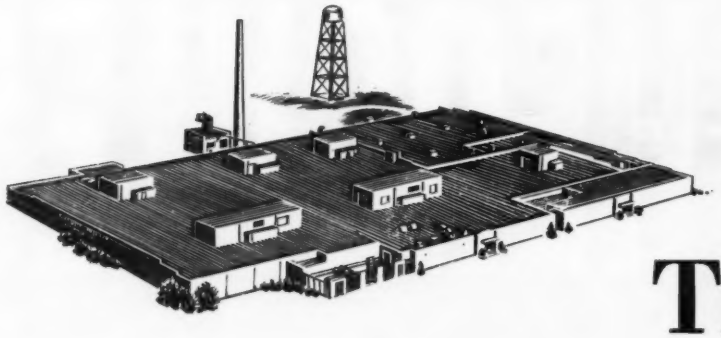


# Thinking of moving?

***Each year management in dozens of mills—large and small—does. Here are the factors to weigh when you consider moving to a more profitable location***

**by Richard F. Torrey**
*Director of Area Development*
*Niagara Mohawk Power Corp.*

**Exclusive**

MOVEMENT of operations to a more profitable location is a problem facing the management of dozens of mills, both large and small, each year. The mass migration from North to South right after World War II has abated, but the movement continues at a steady pace.

High production costs are of course the principal reason for moving a mill—whether the costs are caused by the labor situation, tax rates, antiquated buildings, obsolete equipment or a combination of these and other factors.

The selection of a new plant site has become an exacting science. No longer can the textile man locate a new plant by sheer whim or intuition. And the industry no longer can simply consider automatic expansion of present locations solely because they were chosen 50 years before. Hit-or-miss plant locations often result in costly penalties.

The largest single issue then, which faces any management, when considering plant location is —where? But, even more paramount is—how? How does a textile manufacturer—large or small —choose the right location for his new plant? Furthermore, what services are available to these industries to assist them in the selection of a new plant site?

**Consider Many Factors First.** There is no single answer or formula which will determine the selection of a successful and profitable plant location. Nor are there any conventional rules of procedure. Each manufacturer has basic requirements which are personal to his particular operation and must treat his site selection as an individual case.

Manufacturers of textiles are very limited in the site selection because of the industry's specialized requirements. Therefore, the selection of a plant site should start with a check list of the manufacturers' specific needs.

There are many variables involved here. The textile industries are labor oriented. Labor costs generally constitute the greatest single direct expense after raw materials. A favorable labor cost (wage productivity) situation is necessary for the successful operation of these industries and can usually offset transportation costs.

A plant expansion may be required for production of newly developed products or processes. Or, perhaps existing facilities are outmoded and the new plant must provide savings in operating costs. The check list is very extensive—water, waste disposal, utilities, etc.

A common requirement, basic to almost every industry, is a site which will permit the most economical accumulation of raw materials and services, processes, and distribution of finished products. The ideal site is where the total of these costs is the lowest, and where the industry is compatible with the community. These costs, naturally, will vary from location to location. To effectively evaluate the areas of consideration, current operating costs should be charted for comparison against future site. The following items offer a simple guide for charting such expenses:

1. Labor
2. Transportation

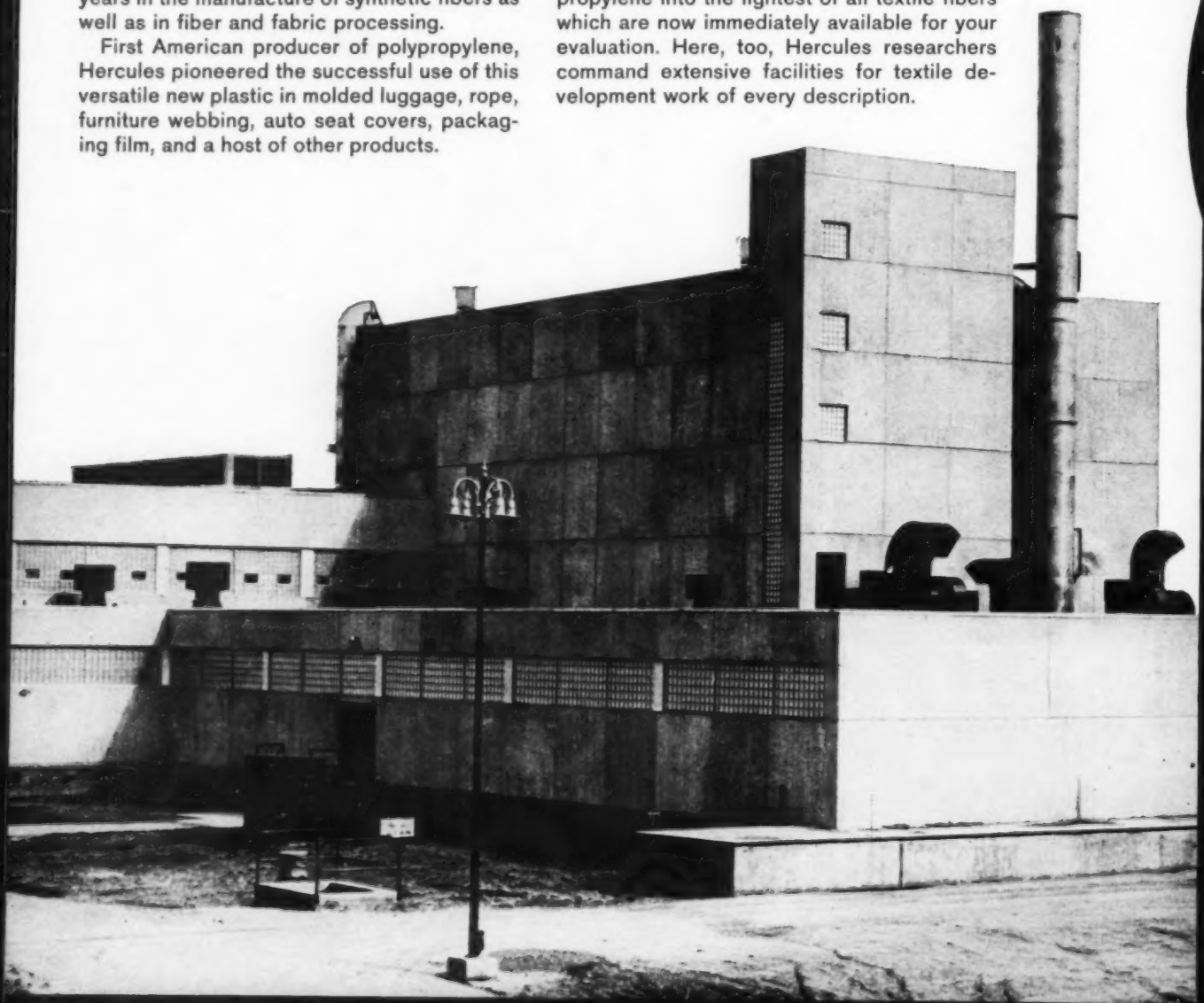
*Continued on page 93*

# WAY OUT FRONT... HERCULES®

No strangers to the textile industry, Hercules products have been used for more than 35 years in the manufacture of synthetic fibers as well as in fiber and fabric processing.

First American producer of polypropylene, Hercules pioneered the successful use of this versatile new plastic in molded luggage, rope, furniture webbing, auto seat covers, packaging film, and a host of other products.

Now on stream, this new Hercules plant at Covington, Virginia, is spinning Hercules polypropylene into the lightest of all textile fibers which are now immediately available for your evaluation. Here, too, Hercules researchers command extensive facilities for textile development work of every description.



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**Hercules... FIRST commercial producer of polypropylene in the United States, now leads the way in the commercial production of polypropylene fiber**

**IT'S HERE**... first commercial polypropylene fiber, available as continuous multifilament yarn, staple, and tow. It's Hercules polypropylene, the new olefin fiber destined to become the new star in textile constructions... and cost reductions. So light it actually floats, Hercules polypropylene provides greater coverage per pound than any other fiber. It's strong and tough, rates high in resistance to mechanical abuse and chemical attack.

The variety of constructions made with Hercules polypropylene fiber in cooperative studies has already won high acclaim from technicians and designers. We invite you to share in the profitable future of this new fiber—and welcome the opportunity to work with you on product development. To aid you in evaluating markets, ask for detailed physical properties, denier tables, comparative coverage data, and other facts about Hercules polypropylene fiber.

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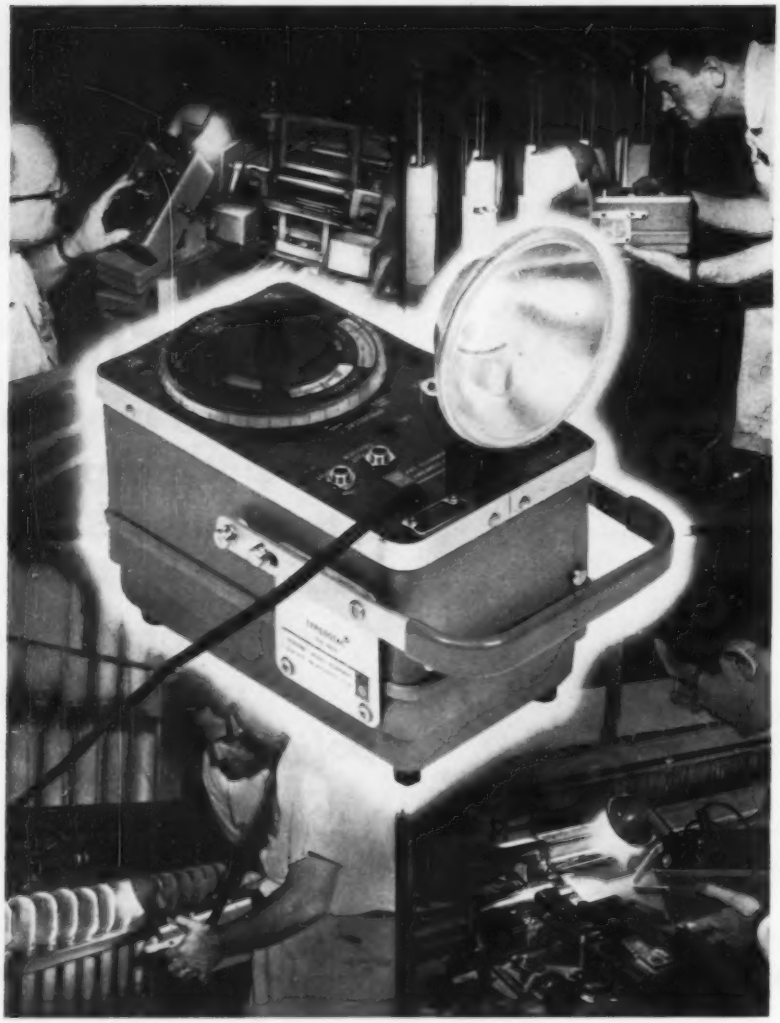
## A textile troubleshooter that shows you...



**Spinning frame troubles**

- excessive band and tape slippage
- crooked idlers
- poor spindle-spring pressure
- crooked, split or worn bobbins
- wrong spindle speeds
- spindles that need oiling
- spindles out of plumb
- defective twister tubes
- uneven rings
- worn travelers
- frayed filaments
- slapping balloons

**Knitting faults**

- bad needle latches
- floating feed yarn caused by uneven tension
- faulty sinker and needle action
- poor needle alignment
- wrong lead or lag of sinkers with needles

**Pin drafter problems**

- poor faller bar and lifter cam action
- uneven comb penetration into sliver
- eccentricity and flatness in drawing-off roll

**Roving frame troubles**

- lint accumulation in flyer eyes
- improper pressure on yarn applied by presser
- wrong spindle speeds
- roving not in flyer arm slot

**Loom problems**

- poor shuttle action
- behavior of filling as it comes out of shutter box
- yarn abrasion caused by shuttle
- bad feeler action

***...And many other troubles caused by improperly operating mechanical parts.***

★ Intense white light permits checks to be made even in brightly lighted rooms.
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★ Long-throw beam reaches deep into machinery.
★ Easy to use — one simplified dial and range switch controls flashing rate.
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**Site-Selection Factors—A Check List for Mill Management**

| | |
|---|---|
| Power | Local Taxes and Legislation |
| *Proximity to Markets* | *Future Taxes* |
| Proximity to Raw Materials | Financing Arrangements |
| *Labor Supply* | *Zoning* |
| Labor Potential | Climate |
| *Labor Force Patterns* | *Size of Community* |
| Labor Training Program | Community Attitudes |
| *Labor Legislation* | *Housing* |
| Unemployment | Schools |
| *Water Supply* | *Cost of Living* |
| Utilities | Recreational Facilities |
| *Water Transportation* | *Neighboring Industries* |
| Motor Transportation | Size of Available Sites |
| *Commercial Air Service* | *Vacant Buildings* |
| Rail Service | Expansion Possibilities |
| *Mail, Parcel Post and Express* | *Land and Building Costs* |
| Communications | Sewage Disposal Facilities |
| *State Legislation* | *Attractiveness of community as a place to work and live* |
| State Taxes | |

3. General plant operating expenses
4. Utilities
5. Taxes
6. Miscellaneous items

Once a definition of the specific needs has been arrived at, the task of selecting a geographical area for new plant location will be greatly simplified.

**Services Offered Industry Are Extensive.** After a general geographic area has been defined, a wealth of plant location services are available to manufacturers to assist in the logical selection of a specific community and site. Private development corporations, chambers of commerce, industrial real estate firms, and local governments offer help in the selection of a site; however, these services in most instances deal only with local communities and regions. Encompassing a larger area of interest are state governments, privately owned gas and electric utility corporations, and railroads, who probably offer the most complete list of plant location services. All of these groups work in close cooperation with the local development organizations in their service to industry. In almost every case, there is no cost or obligation for these services.

A typical utility corporation offers complete assistance in all phases of a plant location project and has a special department devoted to area and industrial development. These organizations will usually supplement their basic material with tailor-made analyses of specific sites upon your request.

Essential to manufacturers considering new plant location or expansions are the financial arrangements. Would your business be in a better position financially, by leasing or by building? What about a purchase lease-back? Would a new building be necessary or would existing structures be considered? What is the availability of mortgage money? These are further considerations in the selection of a site.

**Hints for Site Selection.** Assembled here, in brief, are several valuable hints which can be used in your site selection.

1. Outline specific requirements for your industry before investigating areas.
2. Make careful and critical analyses of all findings.
3. Double check long-range utility supplies and rates based on present requirements.
4. Carefully evaluate the community and the attitudes of its people. These are the individuals who will comprise your labor force.
5. Compute freight transportation costs (i.e. water, rail, motor).
6. Double check long-range water supplies and waste disposal restrictions.
7. Thoroughly investigate site development costs.
8. Check services offered by state and local governments.
9. Give careful consideration to such factors as general business climate, schools, housing, community facilities, etc.

# Plant location can be key to textiles' self-help

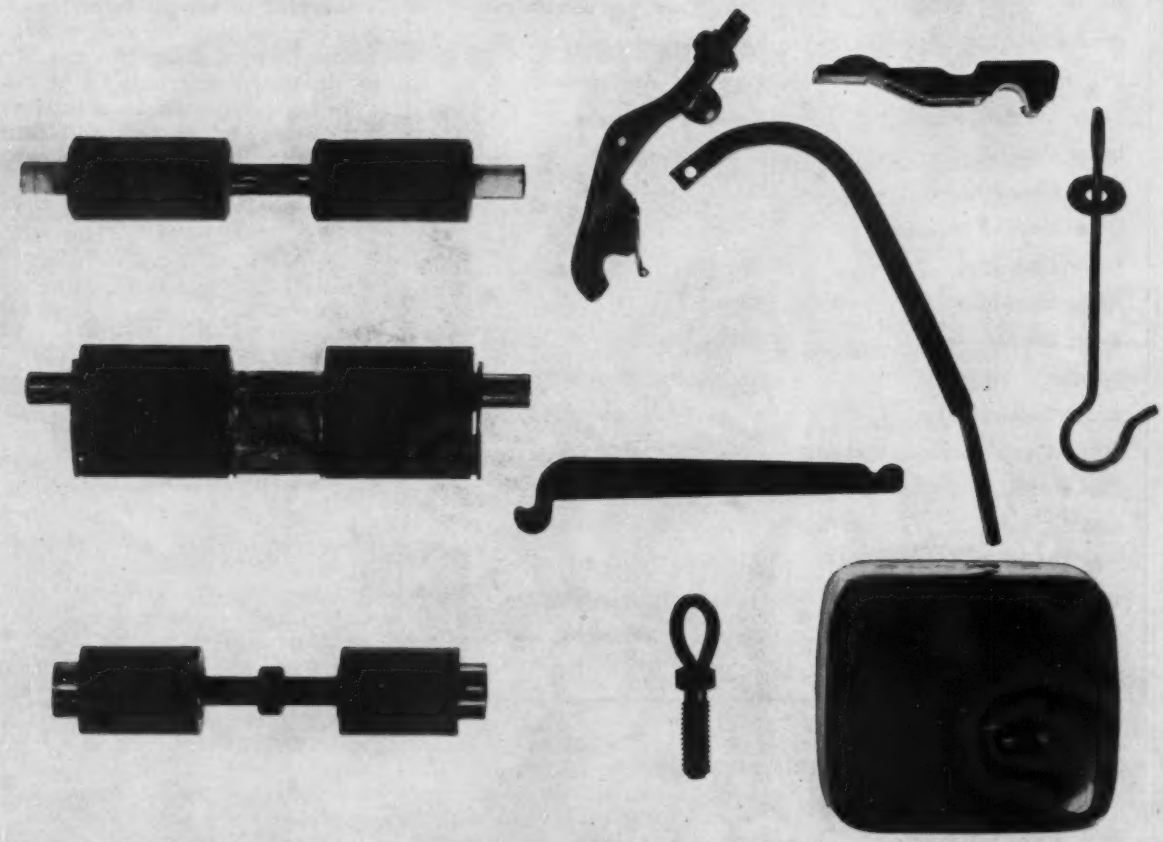
**by Frank G. Binswanger, Jr.**
*President*
*Binswanger Corp.*

■ THE PROBLEMS faced by the textile industry last year inevitably affected the movement of textile manufacturers to the South, but they by no means altered the fundamental trend. Advantages offered by the South to the textile field were as strong as ever. Most important was the business climate of the southern states and communities.

A great part of the industrialization of the South can be attributed to this factor, which is hard to measure but has a definite effect on the decisions of industry. When a community shows, through the attitude of its government officials and civic leaders, that it is sympathetic with the problems of business, it offers an attraction to the manufacturing company that outweighs many other considerations.

Most of the southern communities have this sympathetic attitude, for

# Which is easier to care for...



# This...

3500 less parts to
oil, clean, maintain when you
switch to MagneDraft...
the only Spinning System
that consistently
produces high quality

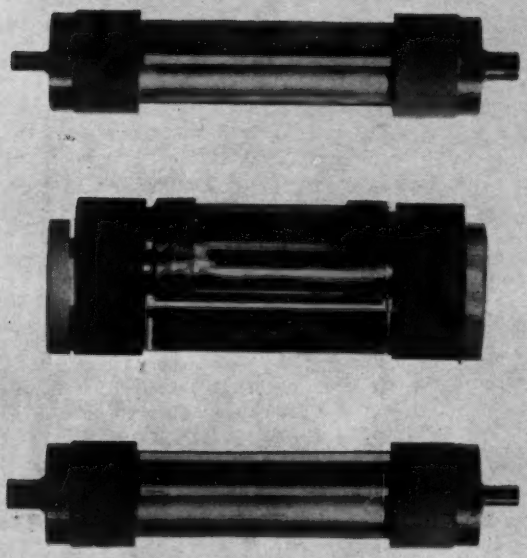
Saco-Lowell's MagneDraft* spinning system lets you replace the complicated and cumbersome drafting of conventional systems, shown above at left, with the simple 3-piece assembly, above next page.

MagneDraft's simplicity results from unvarying magnetic forces. Saddles, stirrups, levers, hooks and springs or weights are dispensed with entirely, for 7 less parts per 2 spindles... 3500 fewer parts per 1000 spindles.

With no lubrication required in the drafting zone, MagneDraft spins cleaner. Parts that do require cleaning are easily reached — for a savings, in all, of 60 to 90% of normal cleaning time.

Like all Saco-Lowell products, MagneDraft spinning systems have these two important plus values for you:

**Built for Better Performance.** MagneDraft creates a positive nip. The squeezing action between top and bottom rolls eliminates deflection of the bottom rolls.



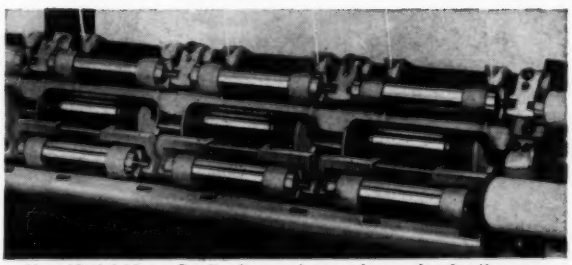
# Or This?

**Backed by Better Service.** A staff of specially trained consultants is available to help you in planning your MagneDraft installation or change-over... to provide any data or assistance you may wish.

Already in use in mills everywhere, MagneDraft is preferred by mill personnel at every level... proving once more that in textiles, as in other fields, the simplest answer is often the best.

*U.S. Patent Number 2,686,940.

For reprints of an actual mill report on MagneDraft performance, with statistical tabulations, write Saco-Lowell Shops, Textile Machinery Division, Greenville, S. C. Or contact the Saco-Lowell sales office nearest you.



New Model MagneDraft, shown above, wins praise for the convenient end-around piecing its top front roll support permits. Available also in standard model without this feature.

**SACO-LOWELL SHOPS**

**TEXTILE MACHINERY DIVISION**

EXECUTIVE AND SALES OFFICES, GREENVILLE, S. C.

BRANCH SALES OFFICES: ATLANTA, GA., CHARLOTTE AND GREENSBORO, N. C., GREENVILLE, S. C., AND SACO, MAINE.

they have learned that the coming of new industry means great economic benefits to the area and its citizens.

Textile leaders have become aware of this over the years. They have learned of the cooperative labor in the South, the excellent transportation, raw materials, and growing markets. In 1960, several leading companies either opened new manufacturing facilities in the South, or moved their manufacturing operations from other parts of the country.

THERE IS NO easy answer to the foreign competition problem, obviously. But in seeking solutions, the textile industry may emerge stronger than ever, by recognizing that the ultimate answer may lie within the industry, rather than in action by governmental agencies of any sort.

The textile industry's biggest concern is costs, just as is the case in other industries. In textiles, the cost factor is aggravated by the competition of relatively cheap foreign labor, but this does not mean that labor is the only cost item on which American textiles are competing with other countries.

Realistically, it seems to be too much to expect the Federal Government to limit textile imports drastically. We may hope for a more adequate depreciation system on plant and equipment, but we cannot count on it. The government may act on other fronts to assist the industry—or it may not. Thus, the most effective action is likely to come from companies in the textile field which do not wait for government action, but instead press forward with their own efforts to deal with the cost factor as a complete package.

Plant costs are part of this package, as are transportation, raw materials, distance from markets, labor, and many more. The company which attempts to deal with all of them, rather than placing reliance in any one item, has the best chance of conquering the problem.

It is in dealing with costs that the plant location specialist can be of great help to the industry. For the professional plant location firm is concerned not only with the walls and roof of a plant, but also all the other factors that are important in industrial operations.

Textile leaders with whom we do business have pointed out that cheap foreign labor is only one aspect of the increasing competition from abroad, although it is a very important one. Many of the textile plants in Japan and other foreign countries are new. Built since the war, and in many cases in the past few years, they are equipped with the latest and most efficient machinery which enables them to reduce their unit costs still further.

In this country, moving to a new plant may provide an excellent opportunity for a textile manufacturer to review all his costs, and to decide that now is the time for him to do something, on his own, to meet the threat of foreign competition.

Treating all his costs as a single package, he may use the new plant to house the most efficient machinery. He may locate it in an area where labor, materials, transportation, and other costs are most favorable. While he will not be able to compete with foreign imports on labor alone, he may well find that on over-all efficiency and over-all cost control his company's competitive position will be vastly improved.

The Department of Commerce has forecast that $500,000,000 will be spent in textile mill modernization and building in 1961. We firmly believe that the best results will be gained from that spending if a new location or building is made the key to a company's own efforts to improve its operations in order to meet competition from abroad or anywhere else. Companies which wait for someone else to solve their problems are apt to find that the problems won't be solved.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# Fast test

*(from page 80)*

Sample size is an important factor to consider where only small samples of cotton are available.

## Conclusions

At its present stage of development this accelerated spinning technique appears promising for indicating the relative level of end breakage and the probable optimum production spinning rate for different cottons. The 5½ hours required to test a cotton is relatively short, and the small amount of cotton required is an advantage. Additional work is needed to interpret and analyze the significance of the shape of the end breakage curve and to determine the reproducibility of the technique on cottons of different fiber properties.


**Acknowledgments**

The author is indebted to the personnel at the USDA Cotton Field Station, Knoxville, Tenn., for helpful information and suggestions in this investigation. The author also wishes to express his appreciation to Noble H. Groves for his assistance with the spinning tests, without which the handling of the project would have been most difficult. Gratitude is also due Louis A. Fiori and John D. Tallant for making available the experimental cottons used in this experiment. Special acknowledgment is due Lorraine A. Leitz for calculating and differentiating the polynomial curves to obtain points of minimum end breakage.


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# web control NEWS

Volume 1, Number 3

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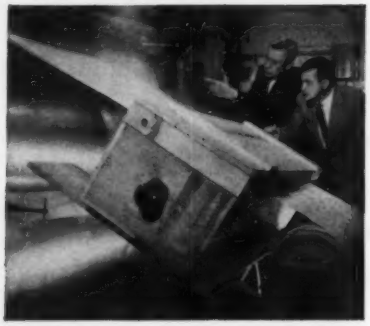

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# WET PROCESSING

by Joe Wauters
Exclusive

*Proper scouring is essential for good results in*

# WOOLEN HOSE DYEING

SINCE all woolen hose reaching the dyer contain a measure of foreign matter, equalled only by silk in variety and quantity, the dyer is forced to give the material a good scour if he is to get a satisfactory dye job. The natural and saponifiable oils fall out easily under conventional treatment, but some of the unwanted materials prove stubborn.

For instance, the mineral oils, oxidized and polymerized fats, machine grease, etc., frequently require special scouring and (occasionally) special dyeing conditions.

To scour wool of good quality and adequate cleanliness, add soap to the scouring liquors. If soft water is used, 5% ammonia and 5% soap (both figured on the weight of the goods) usually are sufficient, the amount of protective agent being varied with the quality of the wool hosiery. One such agent is chemically an albumin and not related to the lignin liquors sometimes used for this purpose.

This albumin possesses remarkable action for both silk and wool, and its use in various processes prevents harshness as well as chafing, shrinking, or yellowing. It is not precipitated by alkalies or acids.

Scouring is carried out in a liquor ratio of 30:1, starting at 105 F and gradually raising the temperature to 120 F. The hosiery is worked well for 20 to 30 minutes, and then rinsed, first in lukewarm

water and, finally, in cold water until the liquor is clear.

Experience in dyeing wool hosiery has shown that improper scouring, either by careless weighing of the scouring agents, excess alkalies, high temperatures, etc., will produce poor dyeings and a harsh, brittle hand. Uneven dyeing can be traced to poor scouring and rinsing, and it is therefore advisable to use a synthetic detergent along with the soap and ammonia (or soda ash) in the scouring liquor to avoid lime soaps and calcium salts. Sodium hexametaphosphate is also used to advantage in the rinses following scouring if water softness is doubtful.

**Monochrome Treatment.** Considering felting, shrinking, and strength, the monochrome process is the least harmful to wool hosiery. Generally, regular percentages of acid and dye have little adverse effect on the hand of the hosiery.

In mordanting processes the extent to which wool is damaged by potassium bichromate gets greater with the lowering of the pH because of the disulfide bond attack. In skein wool dyeing, the monochrome process seems less harmful than the onchrome or afterchrome processes. One reason for better results is of course that the pH of the dyebath is close to 5.5, a level at which the wool is least damaged.

If the wool hosiery scour is excessively alkaline, it may be advisable to neutralize first with acetic acid before going in to the dyebath. This avoids boiling the hosiery in a trace of alkali left from the scour. Dyeing takes place from a slightly alkaline bath to slightly acid with a slow rate of exhaustion, and this type of dyeing is ideal for best results. It is important to keep the bath slightly acid toward completion.

The addition of acetic acid at the boil is liable to cause the dyestuff to rush onto the hosiery. The dyebath made up of Glauber's salts and monochrome mordant only is very close to neutral, therefore, instead of adding acetic acid to exhaust the color, it is far better to add ammonium acetate at the start. The ammonium acetate splits up to some extent in the boiling dyebath. Ammonia is gradually passed off and there is gradual production of acetic acid, by which the dyestuff is allowed to go onto the hose in a clean, well-penetrated shade.

With certain dyestuffs, dyeing wool hosiery with the monochrome method may be simplified in the presence of ready-made monochrome mordant. This mordant possesses the property of releasing acid by slow and uniform decomposition, thus effecting slow and gradual absorption of the dyestuff by the wool hosiery.

The chromic acid which is released at the same time as the other acid, chromes the dyestuff on the fiber in such a way that a premature chroming of the dyestuff still remaining in the dyebath is avoided, and thus a precipitation of the dyestuff is possible.

**Procedure.** The dyebath is filled up with water at 95 F to 105 F, and 0.5 per cent of an excellent leveling and penetrating assistant in acid wool dyeing, 3% wool protective agent of the type mentioned earlier in the article, and 1% sulfonated fatty alcohol type detergent.

Work at this low temperature for ten minutes and add 10% calcined Glauber's salts, 3% monochrome mordant, and 5% ammonium acetate. Well-boiled dyestuff is then added slowly to the dyebath until the wool absorbs most of the dyestuff. The temperature is then gradually raised to a boil over a period of 30 minutes, dyeing continued at the boil for one hour, and then sampled.

Slight shading can be corrected with suitable acid dyestuffs. When shading is to be carried out with monochrome dyestuffs, cool the bath down to 120 F and add the corresponding amount of monochrome mordant together with the dyestuff.

Spoiled dyeings are difficult to correct. Some dyestuffs may be partly stripped by making a fresh bath, putting in 10% calcined Glauber's salts, raising to boil, boiling 20 to 40 minutes; also useful is a fresh bath containing 1% ammonia and boiling from 20 to 40 minutes. And in extreme cases 1%-2% pyridine and 1% ammonia may be used. As the quality of the wool hosiery may be impaired, it may possibly be better to redye the goods to a deeper shade or to a black.

All percentages mentioned in the dyeing processes are based on the weight of the wool hosiery, and it is again suggested not to run more than 80 pounds of wool hosiery in a hosiery dyeing machine rated at 100 pounds (or a liquor ratio of 30:1).

Some typical formulas:

**Black**
6% Sulphon Cyanine Black B

**Navy**
1¾% Sulphon Cyanine 5RA Ex. Conc.

**French Blue**
*(amounts are per 100 lb)*
50 gm Wool Fast Blue GLA 260% strength
30 gm Wool Fast Blue BLA Ex.

**Canary Yellow**
*(amounts are per 100 lb)*
28 gm Milling Yellow O
15 gm Wool Fast Orange GA

**Gray**
*(amounts are per 100 lb)*
140 gm Alizarine Blue Black BA
15 gm Wool Fast Orange GA
12 gm Monochrome Red FGA Conc.

**Brown**
1% Anthracene Chromate Brown EBA Ex. Conc.

**Green**
¾% Wool Fast Blue GLA Conc. (260%)
¾% Chrome Yellow A Ex.

**Maroon**
2½% Monochrome Red FGA Conc.
½% Wool Fast Blue BLA Ex.

Each method of dyeing wool hosiery has its special advocates and the choice of method is dependent upon the type of dye, equipment available, and the experience and practice of the dyer in a particular operation.

**Unions.** Wool socks and hosiery often are unions designed for a variety of purposes—for contrast-

*Continued on page 115*

# what new CHEMICAL COTTONS will cost

***New products from cotton: Processes, equipment, and costs***

**by Kenneth M. Decossas, Stanley P. Koltun, and Elmo L. Patton**
*Southern Regional Research Laboratory*[1]
*New Orleans, Louisiana*

**Exclusive**

NEW CHEMICAL cottons having useful and valuable properties have been developed at the Southern Utilization Research and Development Division. These new cotton products have been described by Fisher (1)[2], and the history, progress, and current status of the chemical modification of cotton have been discussed recently by Fisher and Perkerson (2). In addition, evaluations of the cotton chemical processes and of others developed at the Southern Division for producing new derivatives of cottonseed, rice, and tung have been reported by Decossas, Pollard, and Patton (3).

Textile and chemical engineering cost estimation and analysis are an important part of the cotton research program and have been extensively used to select early in the research cycle those processes and products possessing most promise for commercialization. Cost research identifies items of greatest cost, and is useful in considering the feasibility of proposed research, in furthering process and product development, in advancing the commercialization of the more profitable processes, and in evaluating the impact of research on industry. Because evaluations must be made on many processes and products by relatively few personnel, and because many costs of the type needed are not to be found in the literature, methods are

[1]One of the laboratories of the Southern Utilization Research and Development Division, Agricultural Research Service, U.S. Department of Agriculture.

[2]Numbers in parentheses are references at the end of the article.

NOTE: This paper is part of a presentation given at a national meeting of the American Institute of Chemical Engineers, at Tulsa, Okla.

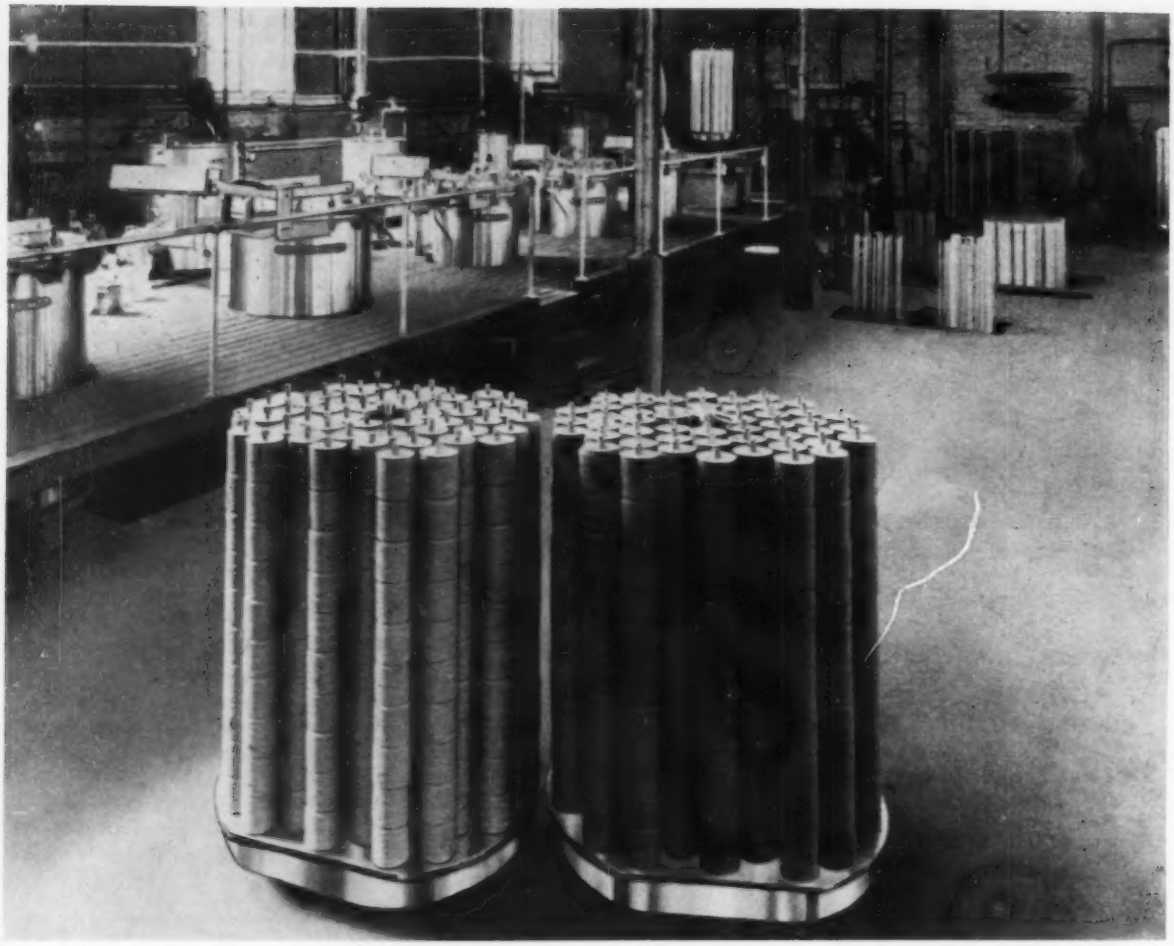
**About This Article**

■ COTTON UTILIZATION research at the Southern Utilization Research and Development Division is offering industry new and improved cotton products having useful and valuable properties. Equipment costs, largely obtained from equipment manufacturers during the past six years, and used in the evaluation of cotton chemical processes, have been adjusted to the December 1959 level, classified for the various equipment units by material of construction and size, charted, and are presented for quick reference and use.

A number of chemical cottons have been prepared at the Southern Division by padding of fabric with chemicals, drying and curing at elevated temperatures, washing the cotton free of unreacted chemicals and byproducts, and final drying of the product. Direct, indirect, and fixed processing costs for these padding-curing finishes, exclusive of chemical costs, have been correlated, generalized, and are charted at processing rates of 10, 50, and 120 yards of fabric per minute.

A preliminary cost estimate is developed from the charts for the APO-THPC flame retardant finish for cotton fabric. This illustrative application results in no significant change in estimated equipment, total plant, and processing costs. Using a projected THPC price of 70 cents per pound, and projected prices for APO ranging from 30 cents to $2.25 per pound, costs for imparting the required degree of flame resistance of fabric varied from 10.1 cents to 23.9 cents per yard of fabric at a processing rate of 120 yards per minute and an annual production of 60,480,000 yards of fabric.

A sliding scale factor is suggested for open-width cotton chemical processing equipment in place of the six-tenths factor generally used in chemical engineering cost estimation.



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sought to expedite the activity.

In this paper, equipment costs, largely obtained from equipment manufacturers during the past six years, and used in these process evaluations, have been adjusted to the December 1959 level using the Marshall and Stevens textile equipment cost index. They have been classified for the various equipment units by material of construction and size; and plotted for quick reference and use. Further, the applicability of the six-tenths cost factor to fabric wet processing equipment has been investigated. This rule says that the cost of a second size of equipment X times the first may be obtained by multiplying the known cost by $X^{0.6}$. In a log-log plot of cost against capacity a straight line with a slope of 0.6 is obtained.

## Equipment Costs

An extensively used sequence of operations in the commercial application of resins to cotton fabric and in the preparation of a number of chemical cottons at the Southern Division is padding of cotton fabric with chemicals, drying and curing at elevated temperatures, washing the cotton free of unreacted chemicals and byproducts, and final drying of the product. *Figure 1* includes some of the processes involving this sequence of operations.

Costs of dryers and curers commonly used in such resin finishing operations versus holding capacity are given in *Figure 2*. The roller dryers and curers have rolls faced with stainless steel. Both roller and loop units are equipped with fans and coils. The loop units are also equipped with conveyors; screens; feeding, looping, and folding mechanisms; temperature controllers; motors; and starters. The slopes of these log-log plots measure about 0.70 for the roller units and 0.65 for the loop units, close to the 0.6 generally used in chemical engineering cost estimation.

There is a compartment for every four rolls in the open width washers of *Figure 4*. Each compartment consists of two top and two immersion rolls and one light

*Continued on page 107*

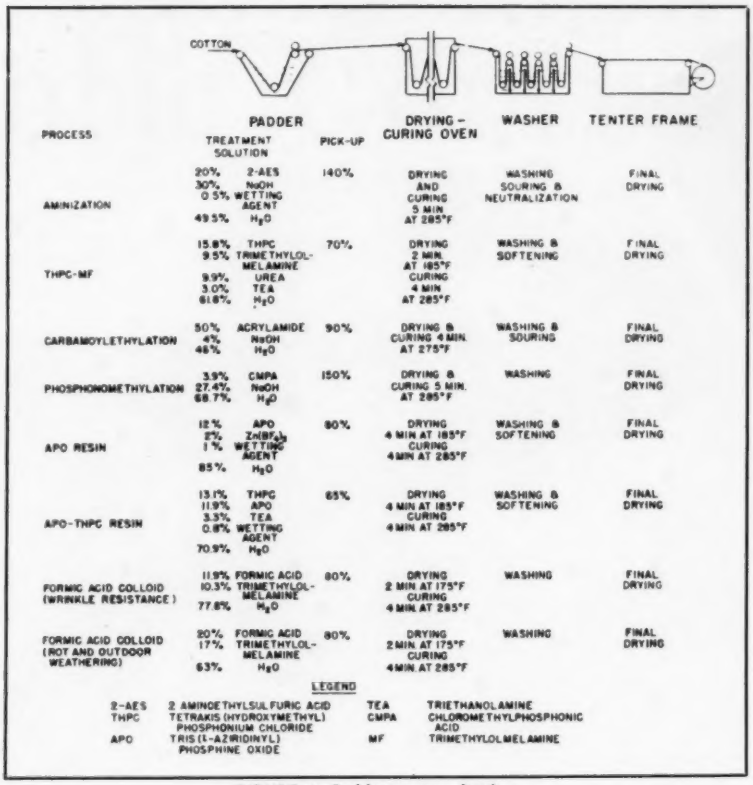
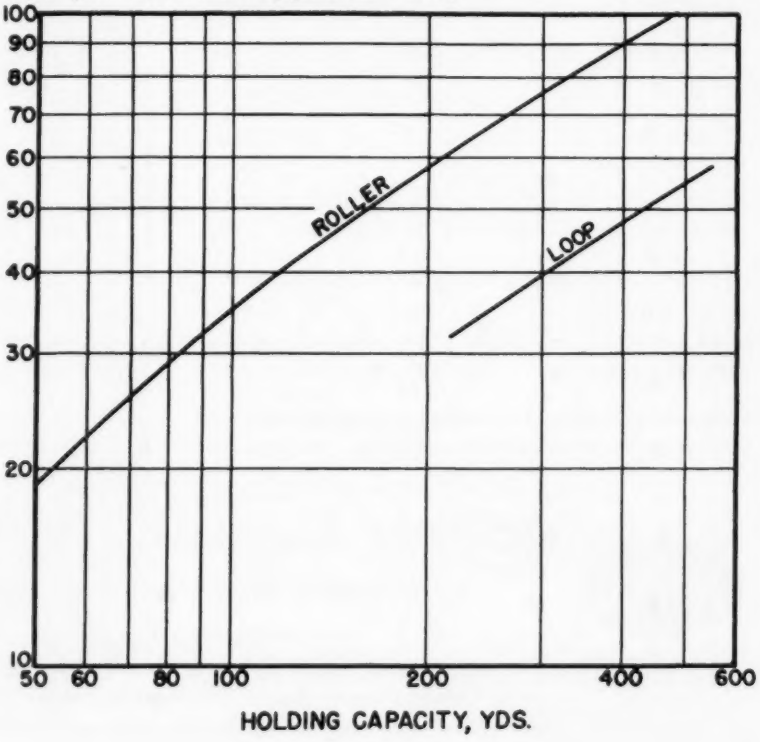



FIGURE 1. Padding-curing finishes.

FIGURE 2. Cost of roller and loop dryers and curers for 60-inch fabric, in thousands of dollars. (Basis: M & S Textile Equipment Index 261.4)



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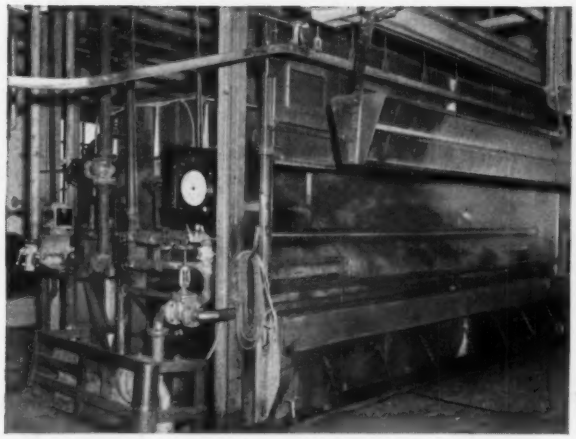

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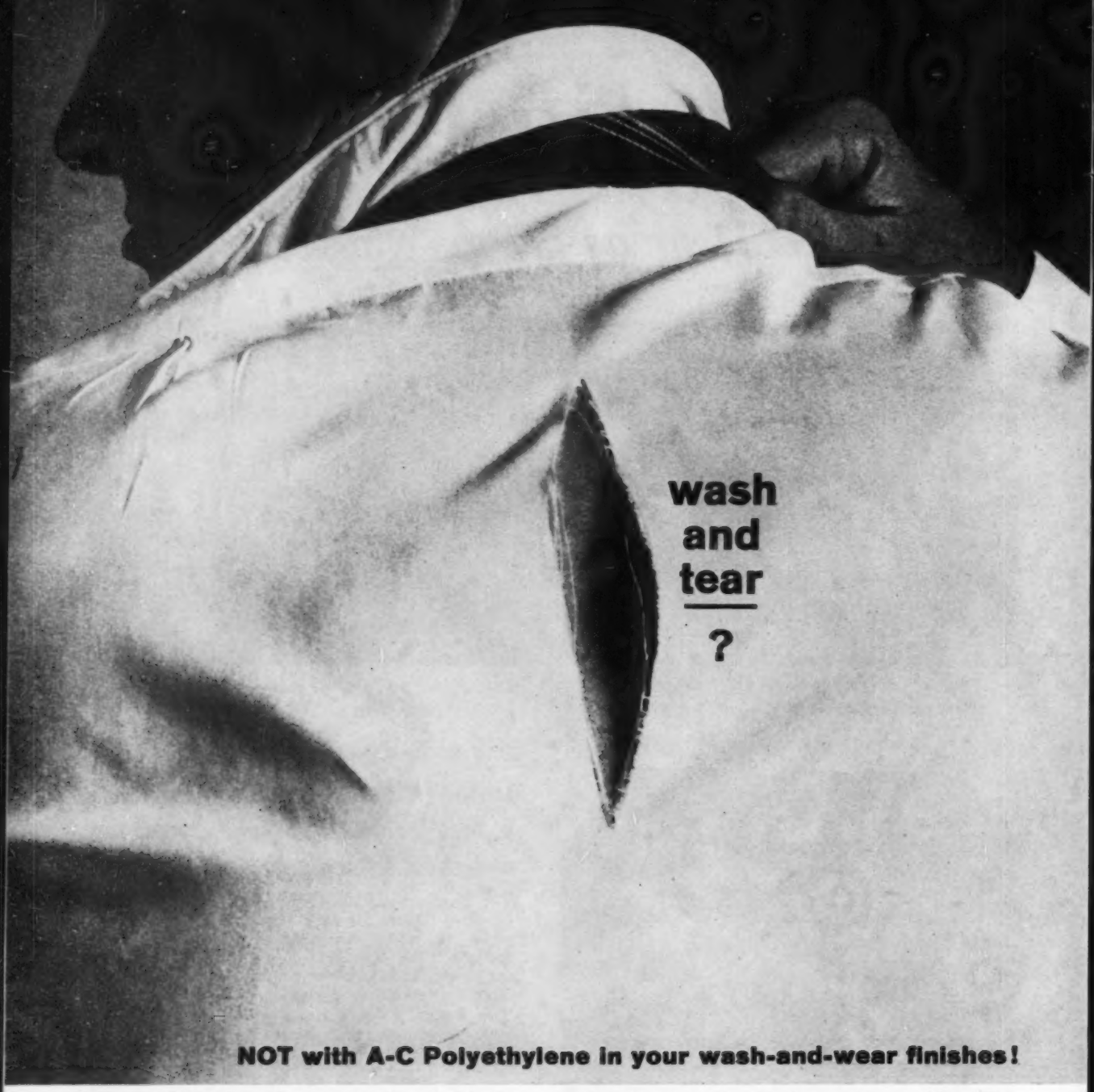


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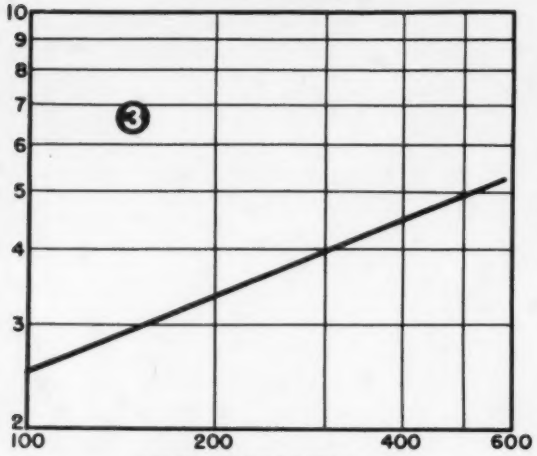
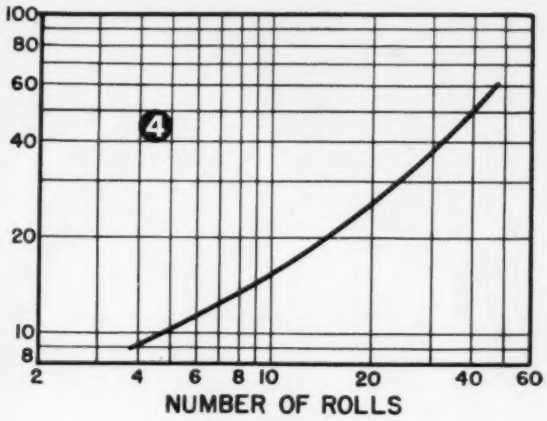
BASIC TO AMERICA'S PROGRESS

FIGURES 3-8. Cost of some equipment commonly used in wet processing ($1,000). (Basis: M & S Textile Equipment Index 261.4)

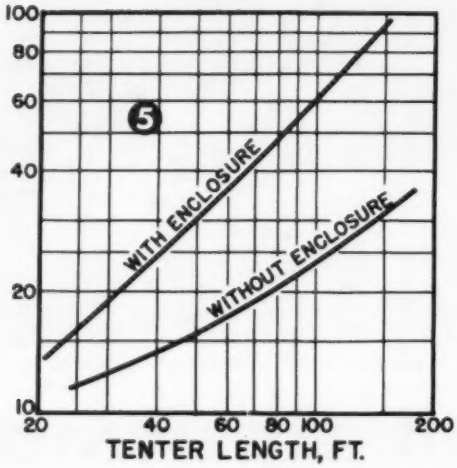
SKEIN DRYERS



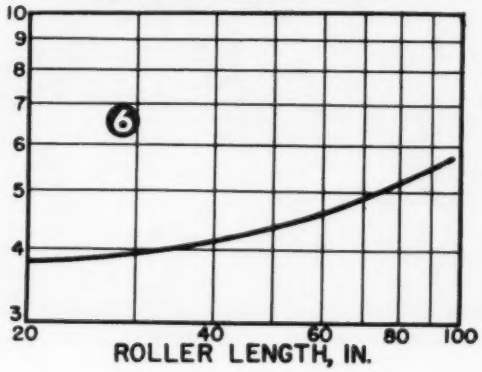

CONTINUOUS OPEN-WIDTH FABRIC WASHERS FOR 60" FABRIC (304 STAINLESS STEEL)



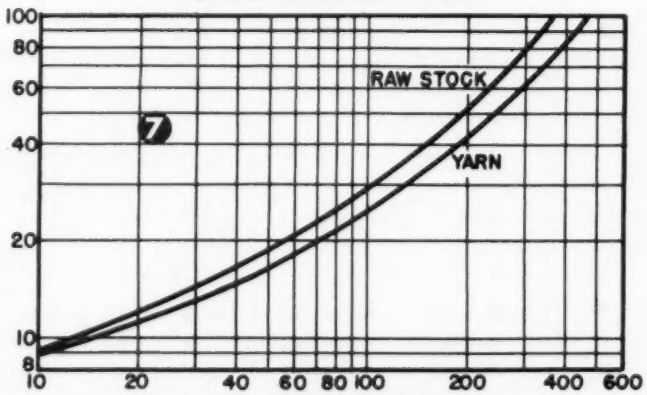

TENTERS (60")




DYE JIGS (304 STAINLESS STEEL)




DYE MACHINES (316 STAINLESS STEEL)

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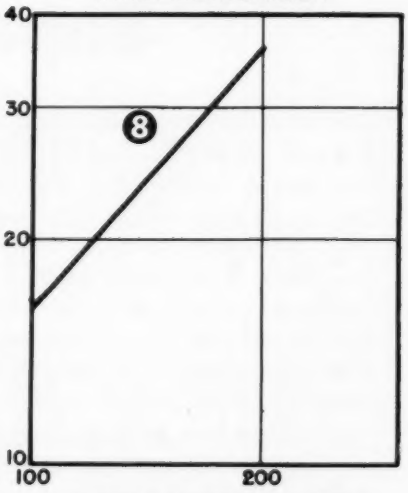


*Continued on page 111*

Leon Moore (above, left), one of 12 Du Pont textile bleaching representatives, discusses a new Du Pont bleaching process . . .

# Here's how Du Pont experience improve product quality

Du Pont technical representatives can bring years of practical textile mill experience to bear on your bleaching operations—and often will suggest ways you can cut costs or improve efficiency. For example, take Leon Moore (pictured above, left), one of Du Pont's twelve highly qualified bleaching specialists. He can help you maintain your processes at peak operating efficiency and also show you how one of Du Pont's new cost-cutting processes can economically fit into your present operation.

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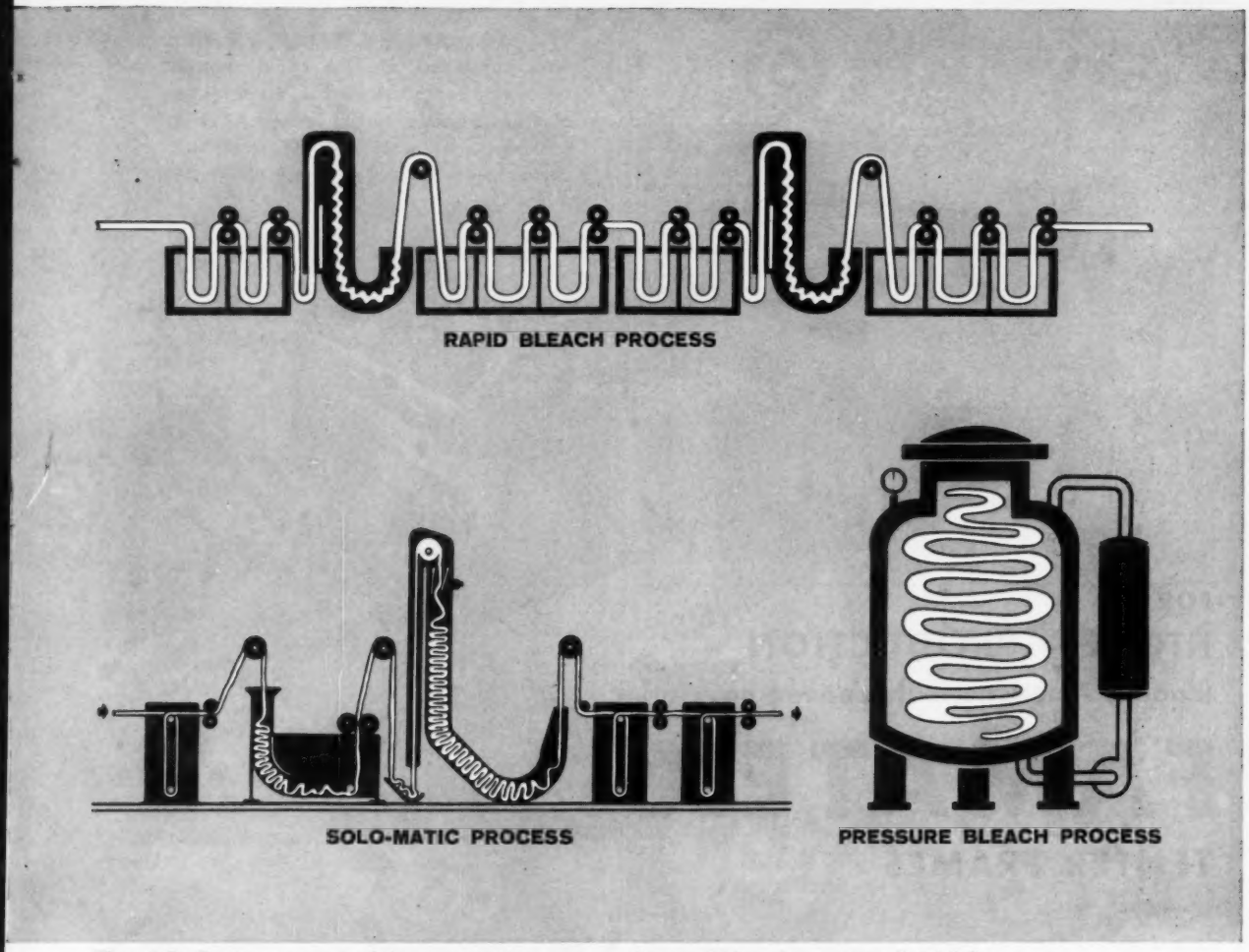


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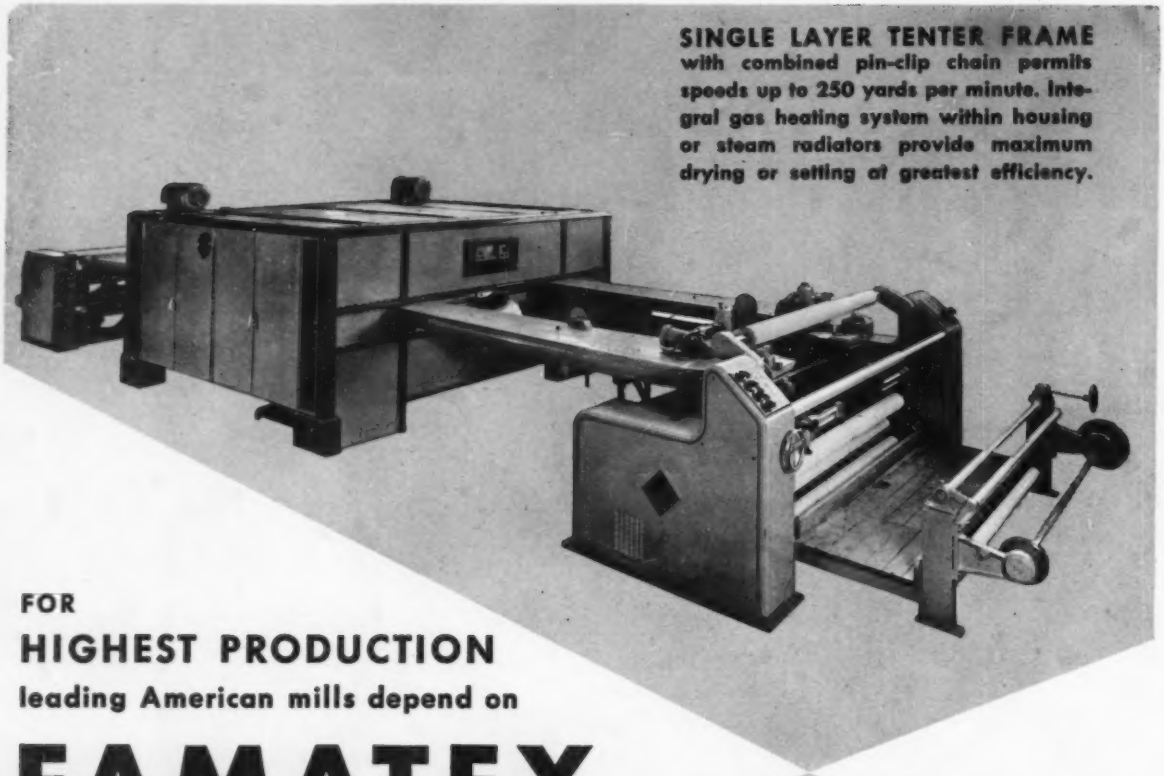

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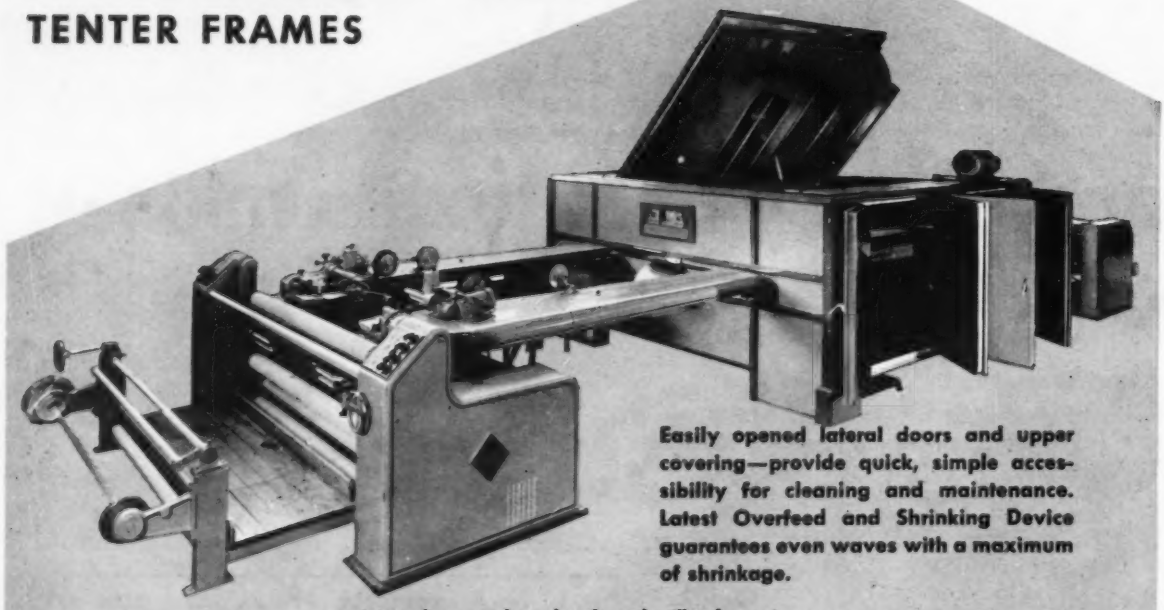

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duty squeezer. Included in the washer cost is a heavy duty squeezer after the last compartment.

*Figure 5* has costs for tenter frames for drying fabrics to specified widths up to 60 inches. The tenters are equipped with heaters, fans, motors, and control instrumentation. Housing is provided on all but the first and last 10-foot tenter lengths. If additional 10-foot sections of housing are needed for one or both ends, the cost to be added to the chart reading is $4,900 per 10-foot section of housing. The slopes measure 1.0 with enclosure and 0.6 without.

Another popular wet processing machine is the dye jig. *Figure 6* shows dye jig costs and illustrates the variation in cost of open width machines with the variation in roller length or equipment width; and was developed from this equation

$$\text{Price Any Width} = \left(\frac{\text{Width}}{60''}\right)^{\text{factor}} \times \text{Price } 60'' \text{ Width}$$

| Width (In.) | 24 | 36 | 48 | 60 | 72 | 84 | 96 |
|---|---|---|---|---|---|---|---|
| Factor | .20 | .25 | .30 | — | .35 | .40 | .45 |

using a rough series of factors provided by an equipment manufacturer for open-width washers and related equipment. This manufacturer cooperated with us in an investigation of the application of the six-tenths factor to open width fabric processing equipment (4).

Comparable cost data have been prepared and plotted for other textile wet processing equipment such as skein dryers in *Figure 3*, package dye machines in *Figure 7*, and hank mercerizing machines in *Figure 8*. The slope for skein dryers is 0.45, and for hank mercerizers is 1.15.

It is quite interesting to note that there is essentially a straight line relationship on log-log paper between costs and various capacities, when capacity is varied in the length of the machine (such as in the cited cases of the roller and loop dryers and curers, and tenters); whereas the curves have a gradually increasing slope when comparing costs at various capacities when capacity is varied in the width of the machine such as in the cited case of the dye jig.

In general, as machine width is varied, the cost of most machines of one manufacturer follows the same general curve shown for dye jigs, although the slopes did vary from machine to machine as did the rate of rise at different points on the curves. A somewhat different sliding scale than that mentioned would have to be worked out for machines such as dye kettles, which also vary in width, as in this case the exponents would range from a little less than 0.3 to 0.6 from 24 inches to 96 inches, with a 60-inch machine as the base.

The sliding scale results from a considerable fixed cost in open-width machines for any width of machine. For example, in open-width washers there is a considerable fixed cost in the bearings and seals for the rolls and not much labor is saved in fabricating the narrower machines, in some cases it being more difficult to fabricate the narrower machines.

In comparing the slopes of the curves where a straight-line relationship is evident, the exponential factor does vary from machine to machine, anywhere between a 0.4 factor to a factor of approximately 1, and, it is doubtful whether the 0.6 factor applies too well on machinery for the textile wet processing industry. Also, on some cast iron and steel equipment, such as squeezers and certain classes of rolls, where a straight-line relationship applies, the factor becomes closer to 0.4.

Therefore, it can be concluded that any general formulas for estimating costs for other sizes or

**TABLE 1. APO-THPC Resin Treatment of Cotton Fabric—Equipment Cost**

| No. | Equipment | Purchased Cost[1] | Installation | Installed Cost[1] |
|---|---|---|---|---|
| | | $ | % | $ |
| 1 | 3-roll padder | 13,000 | 32 | 17,000 |
| 4 | 32-roll washing ranges | 40,000(4) | 25 | 200,000 |
| 1 | 480-yd roller dryer | 100,000 | 32 | 130,000 |
| 1 | 480-yd roller curer | 100,000 | 32 | 130,000 |
| 1 | 120-ft tenter frame + additional 10-ft enclosure | 73,000 + 4,900 | 36 | 110,000 |
| 2 | 3500-gal mixing tanks, 316 ss | — | — | 21,000 |
| 1 | 6000-gal APO storage tank | 9,600 | 40 | 13,000 |
| 1 | 3600-gal softening agent tank | 7,500 | 40 | 11,000 |
| 4 | Pumps with motors | — | — | 1,700 |
| 1 | Wetting agent tank | — | — | 4,900 |
| 1 | 3000-gal triethanolamine tank | 7,300 | 40 | 10,000 |
| | | | | 650,000 |
| | Previous estimate | | | 643,225 |
| | This estimate is 1.1 per cent higher | | | |

[1]Rounded off to two significant figures

**TABLE 2. APO-THPC Resin Treatment of Cotton Fabric—Total Plant Cost[1]**

| | | |
|---|---|---|
| (a) | Installed equipment cost | $ 650,000 |
| (b) | Process piping [13% (a)] | 85,000 |
| (c) | Instrumentation [2% (a)] | 13,000 |
| (d) | Outside lines | 19,000 |
| (e) | Auxiliary facilities | 140,000 |
| (f) | Buildings | 270,000 |
| (g) | Total physical plant cost | $1,180,000 |
| (h) | Engineering and construction [20% (g)] | 240,000 |
| (i) | Contingencies [15% (g)] | 180,000 |
| (j) | Total plant cost | $1,600,000 |
| | Previous estimate | $1,572,755 |
| | This estimate is 1.7 per cent higher | |

[1]Rounded off to two significant figures

FIGURE 9. Continuous processing of 60" cotton fabric: Cost/yd at 10 yd/min.

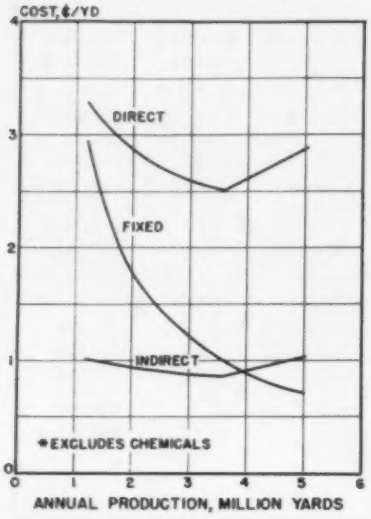



FIGURE 10. Continuous processing of 60" cotton fabric: Cost/yd at 50 yd/min.

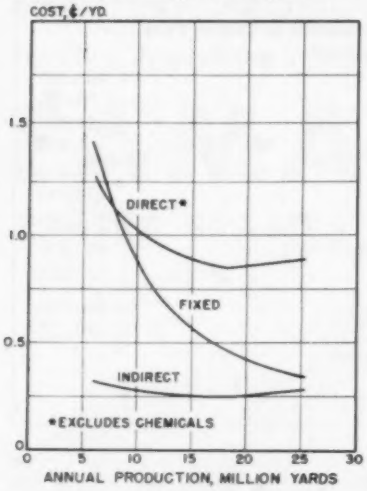



FIGURE 11. Continuous processing of 60" cotton fabric: Cost/yd at 120 yd/min.

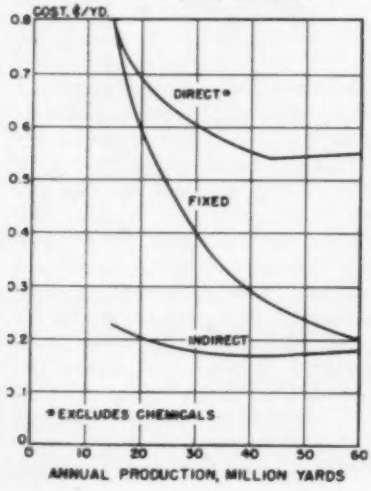



**TABLE 3. APO-THPC Resin Treatment of Cotton Fabric—Processing Costs[1]**

| | APO Price | $2.25/lb Cents per Yard | 30¢/lb Cents per Yard |
|---|---|---|---|
| (a) | Chemicals | 19.44 | 7.62 |
| (b) | Other direct | .55 | .55 |
| (c) | Indirect | .18 | .18 |
| (d) | Fixed | .20 | .20 |
| | | 20.37 | 8.55 |
| (e) | Contingencies | 1.02 | .43 |
| (f) | Total processing cost | 21.39 | 8.98 |
| (g) | Gen adm & overhead [3% (f)] | .64 | .27 |
| (h) | Financing cost | .57 | .31 |
| (i) | Sales[6% (f)] | 1.30 | .54 |
| | Total cost | 23.90 | 10.10 |
| | Previously estimated | 23.9 | 10.1 |

[1]For 8-oz cotton twill, 60" wide, 10% resin add-on, 120 yd/min, 60,480,000 yd annually (see *Figure* 11).

capacities of textile wet processing equipment using the price of a certain size as base price, should be used as a general guide only, because of the large number of variables involved. The six-tenths factor rule is really a pretty general one, and if it is specifically applied to particular machines, it must be remembered that it is only an approximation.

## Total Plant Cost

It has been found that installation, process piping, instrumentation, outside lines, auxiliary facilities, buildings, engineering and construction, contingencies, and other total plant cost factors reported in the literature (5, 6, 7) for chemical engineering cost estimation are generally adaptable for application to cotton chemical processing evaluations.

## Processing Costs

**Padding-Curing Finishes (8-23).** A correlation of processing costs for processes of a similar type has proved useful in preparing preliminary estimates. From the processing costs calculated during the past three years for the various padding - curing finishes cited earlier, and based on equipment costs provided by manufacturers and on specific features of each process, the curves of *Figures 9, 10,* and *11,* have been developed for processing at fabric rates of 10, 50, and 120 yards per minute, respectively, by averaging the unit direct costs exclusive of chemical costs which are highly variable; unit indirect and unit fixed costs. No correlation is possible with chemical costs because they vary considerably between these processes. Also, the prices of a number of the chemicals listed will undoubtedly drop as volume production is achieved.

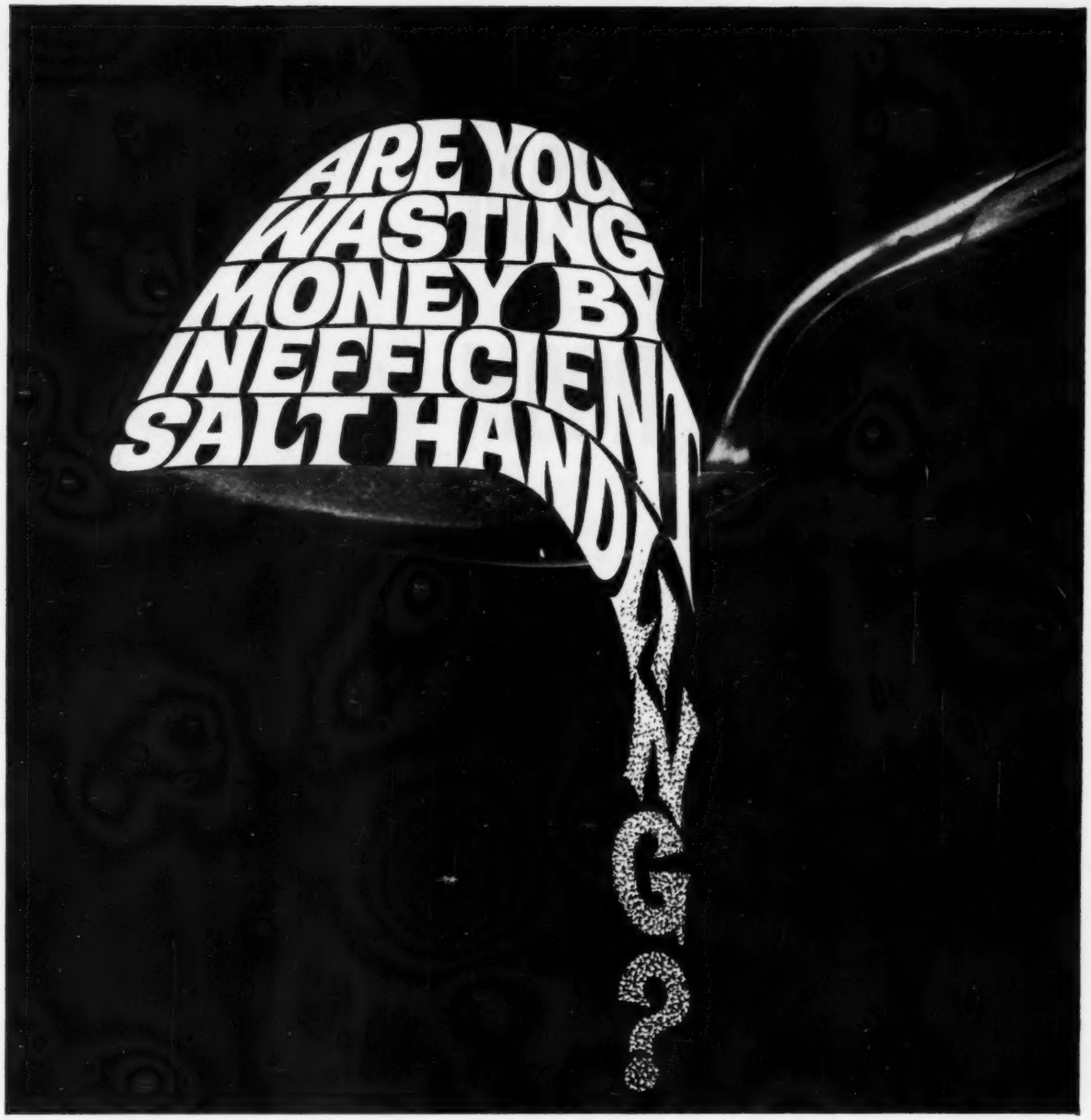
Chemical price projections provided by industry are used extensively in our preliminary cost work. Using these curves, the cost of a similar treatment can be estimated with a considerable saving of time and a good degree of accuracy using this equation:

$$\text{Cost per yard} = 1.09\,[1.05\,(\text{Chemicals} + \text{Direct} + \text{Indirect} + \text{Fixed Costs})] + .05\,(\text{Working Capital} + \text{Total Plant Cost})$$

The 1.05 factor is for contingencies and the 1.09 factor for general administration and overhead, and sales. Financing cost is expressed as five per cent of the sum of working capital and total plant cost.

## Application of Chart

**APO-THPC Resin Finish.** An application of the curves was made in a preliminary cost estimate of

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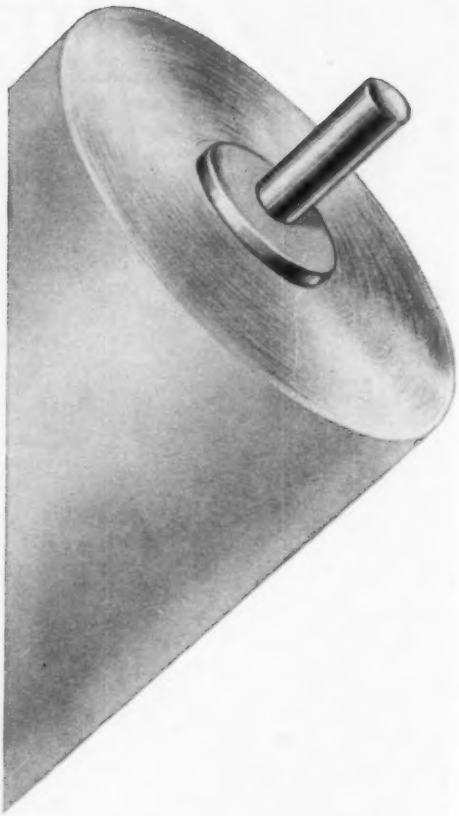

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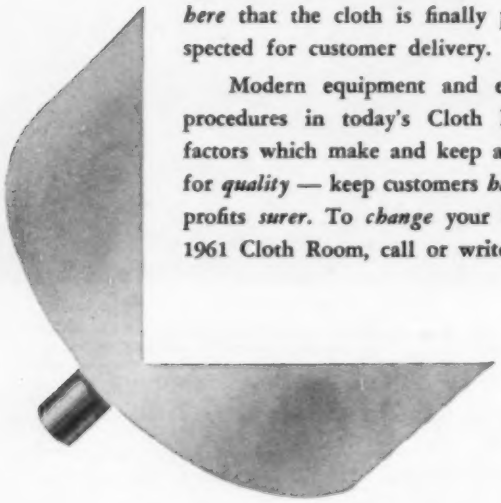

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the APO-THPC[3] process which imparts a new and improved flame retardant finish to cotton. In this treatment cotton is padded through an aqueous solution of APO, THPC, triethanolamine, and wetting agent, dried for four minutes at 185 F, cured for four minutes at 285 F, washed and dried. With a relatively low resin add-on, this treatment yields a product having a very durable flame retardant finish, rot and mildew resistance, and excellent hand.

It was found earlier, on consideration of the individual items of cost for this process, using a projected THPC price of 70 cents per pound, and projected prices for APO ranging from 30 cents to $2.25 per pound, that costs for imparting the required degree of flame resistance to fabric varied from 10.1 cents to 23.9 cents per yard of fabric at a processing rate of 120 yards per minute and an annual production of 60,480,000 yards of fabric.

Using the equipment cost plots shown earlier, installed equipment cost is estimated at $650,000 in comparison with $643,225 estimated earlier, or 1.1 per cent higher. Similarly, total plant cost is $1,600,000 compared to $1,572,755 estimated earlier, or 1.7 per cent higher. Previously estimated processing costs using the processing cost curves and the cited equation were identical—23.9 and 10.1 cents per yard.

## Summary

Textile and chemical engineering cost estimation and analysis, of great importance in today's research operations, are performed during every phase of research at the Southern Utilization Research and Development Division as a part of an intensified research program on cotton and other Southern farm crops.

Equipment costs and operating costs obtained during cotton chemical process evaluations, have been classified, plotted, and presented for quick reference and use. An illustrative application of the charts results in no significant change in estimated equipment, total plant, and processing costs for the APO-THPC flame retardant finish for cotton fabric.

A sliding scale factor is suggested for open-width cotton chemical processing equipment in place of the six-tenths factor generally used in chemical engineering cost estimation.

[3]APO is tris (1-aziridinyl) phosphine oxide; THPC is tetrakis (hydroxymethyl) phosphonium chloride.

**Acknowledgment**

The authors wish to thank Mr. G. I. Pittman, engineering draftsman, for the tracing and inking of the charts used in this paper.

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## Dyeing Wool *(from page 100)*

ing color effects, softer handle with a consequent less irritating effect on the skin of the wearer, ornamental figure designs, a less costly commodity, etc. Most every commercial fiber is utilized in unions.

Wool hosiery, comprised of three and even more types of yarns, is by no means a rarity. The scouring operations ordinarily present no special difficulty. Most wool unions are scoured as an all-wool hose, since the impurities on the material are usually eliminated with less trouble than that on all-wool hosiery. Silk unions are perhaps the only exception.

The throwster tints present on rayon and acetate yarns, however, occasionally cause difficulties. Some of these colors, though fugitive to rayon, act as wool dyestuffs and dye the wool in the scouring operation. When such a condition exists, the use of a small amount of hydrosulfite in the scouring bath is recommended. The reagent discharges the unwanted color from the wool and produces a semi-bleached ground which permits obtaining a white wool and pastel shades.

The use of hydrosulfite involves a somewhat higher scouring temperature and a more prolonged period of preparation. It is rarely advisable to extend the time or raise the scouring unduly. Wool is deteriorated by alkalinity and heat; its affinity for dyestuffs is enhanced, especially for cotton colors; its tensile strength and elongation are reduced; and it acquires a harsh, dry hand and gray, yellowish cast. More serious than any of the above is the tendency of woolen yarns to shrink and felt, thereby materially reducing the size of the hosiery.

The dyes employed in dyeing wool-union hosiery are generally those that possess an affinity for but one of the component fibers. Union colors are prone to yield nonuniform results and produce difficulties in color matching. Such dyes have a different affinity for the component fibers under slightly variable conditions of temperature and pH.

A union color possesses a greater affinity for cotton than wool at 200 F and at a pH of 8. A reversal of this order frequently occurs by a drop in the dye liquor temperature of but a few degrees, or a change in the acidity or alkalinity of the dyebath, thereby rendering dye matching difficult.

As to finishing wool hosiery to improve hand, many of the prepared cationic agents (as well as wool softeners composed of sugar-magnesium chloride combinations) are used because of their hygroscopic nature, thus imparting a softer hand.

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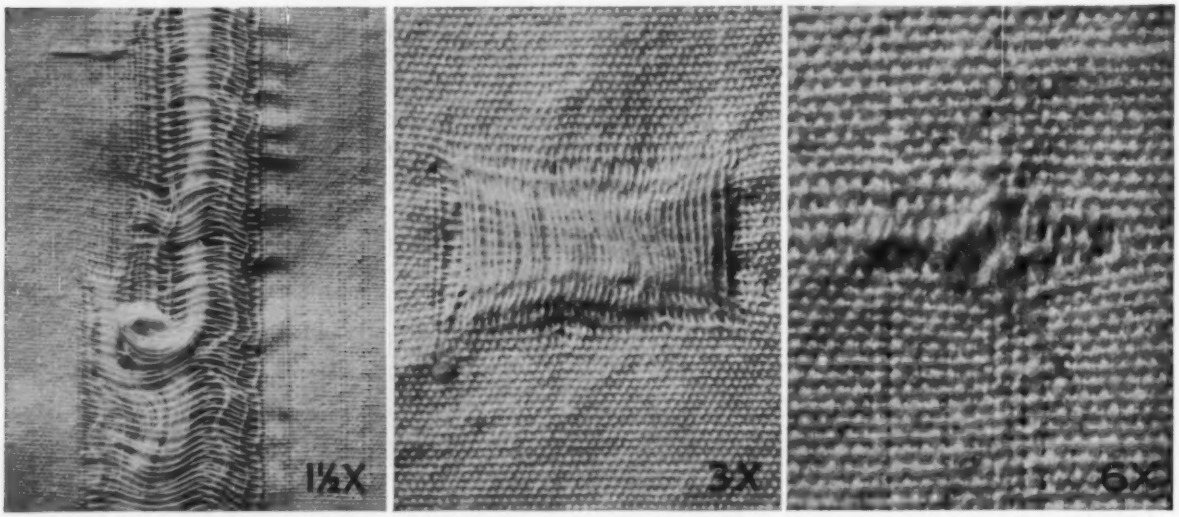


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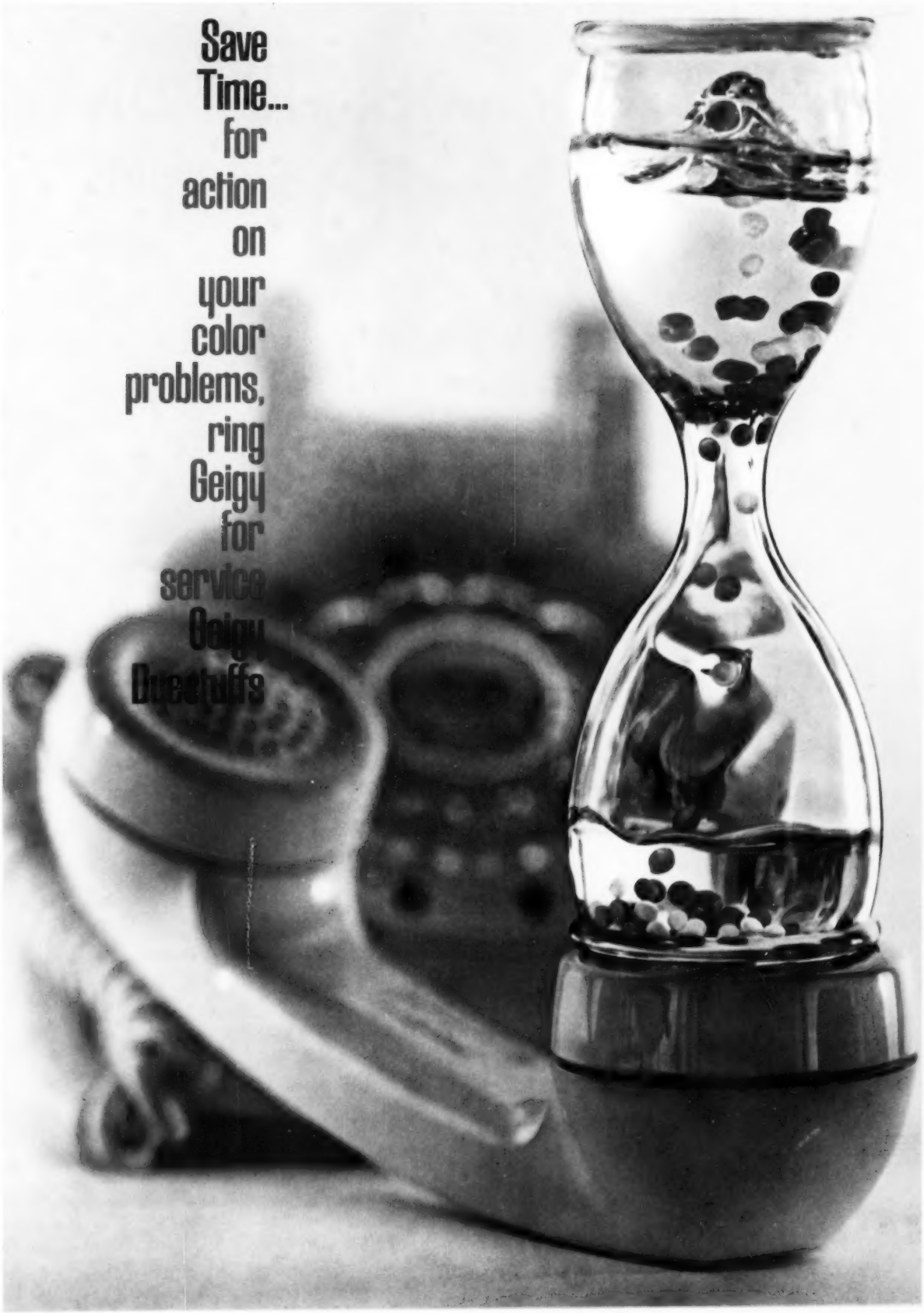
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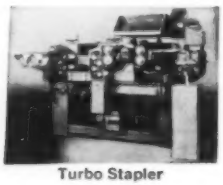
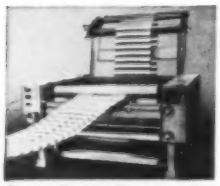
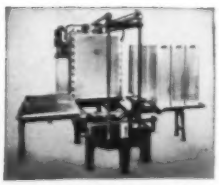


Turbo Stapler

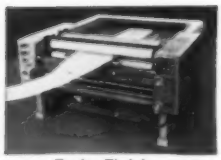
Turbo Dye Boarder



Turbo Padder-Extractor for Tubular Knits



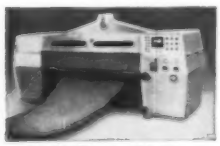
Turbo FS-300 Fiber Setter



Turbo Finisher for Tubular Knits

Turbo Package Dyeing and Drying Machines

Turbo Tow Processing Machine



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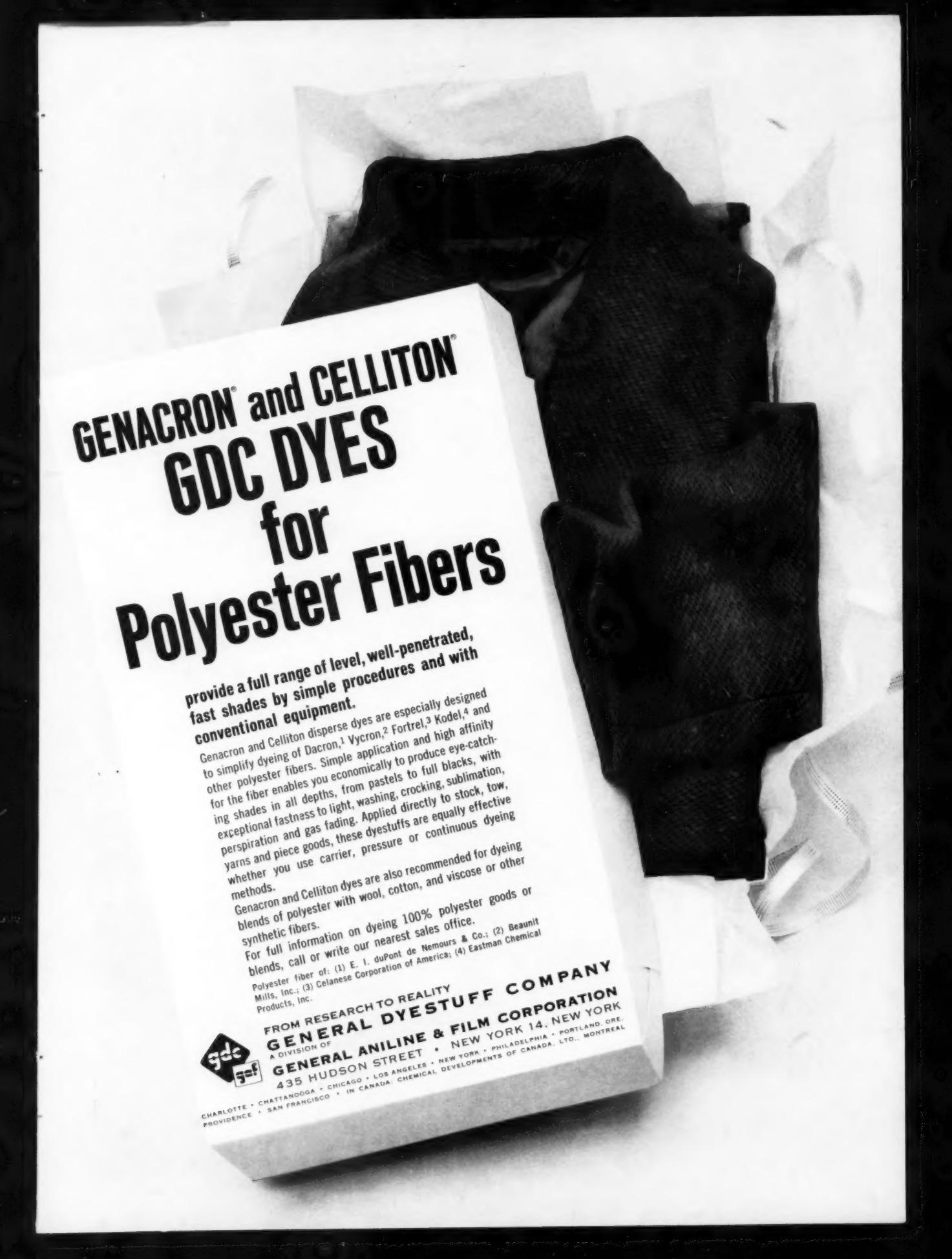
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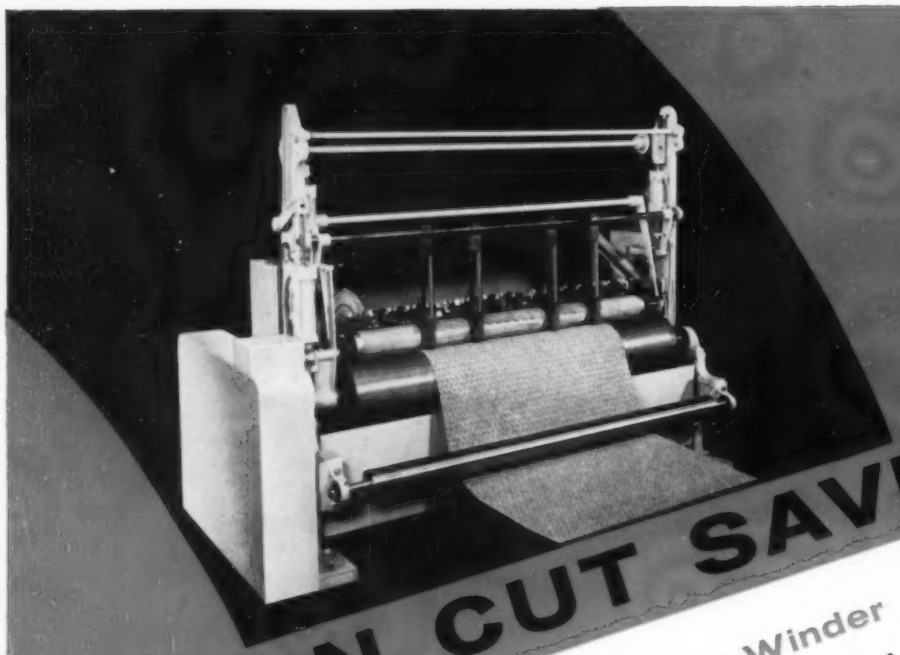

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Pellon Corp., Lowell, Mass.
Associated Dye & Print Co., Inc.
Paterson, N. J.
Bolta Products, Lawrence, Mass.
Canadian Celanese, Ltd.
Drummondville, Que.
Northern Dyeing Corp., Washington, N. J.
Cranston Print Works
Cranston, Rhode Island
Star Woolen Co., Cohoes, N. Y.
Allied Textile Printers, Inc.
Paterson, N. J.
Burlington Industries, Inc.
Greensboro, N. C.
Vanity Fair Mills, Inc., Monroeville, Ala.
H & F Binch Co., Glens Falls, N. Y.
The United Piece Dye Works
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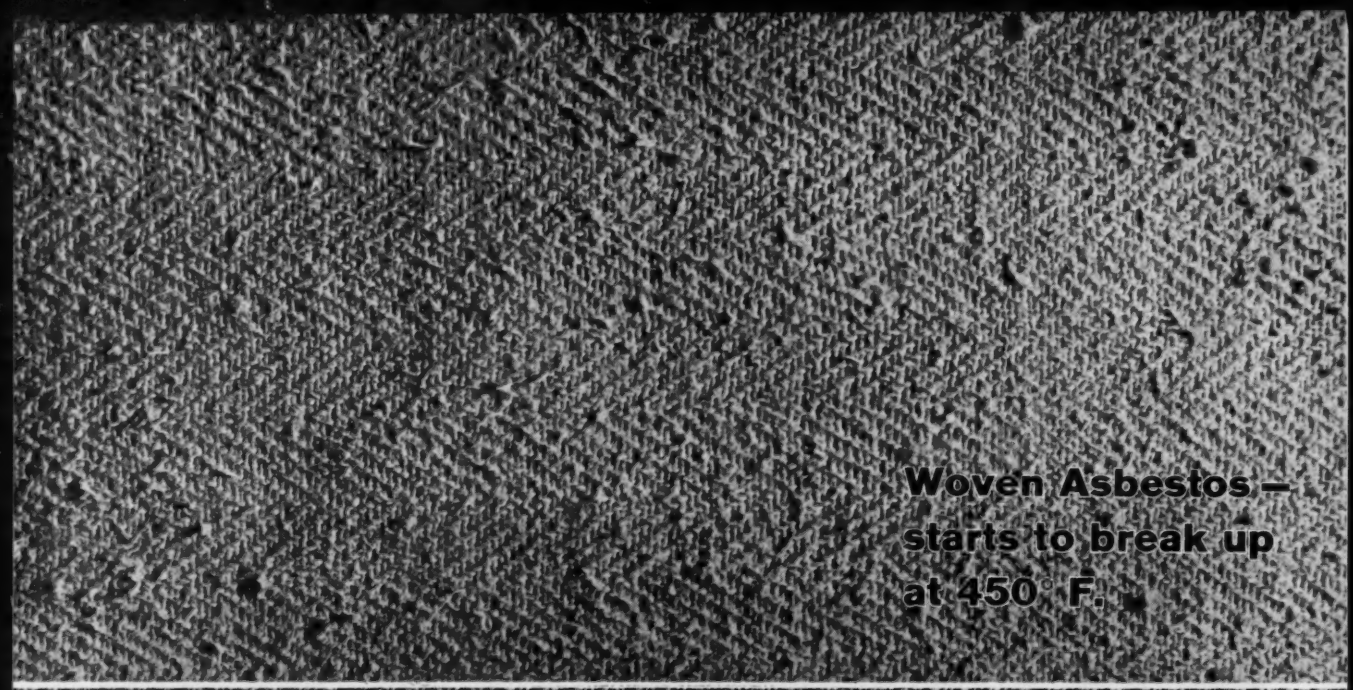


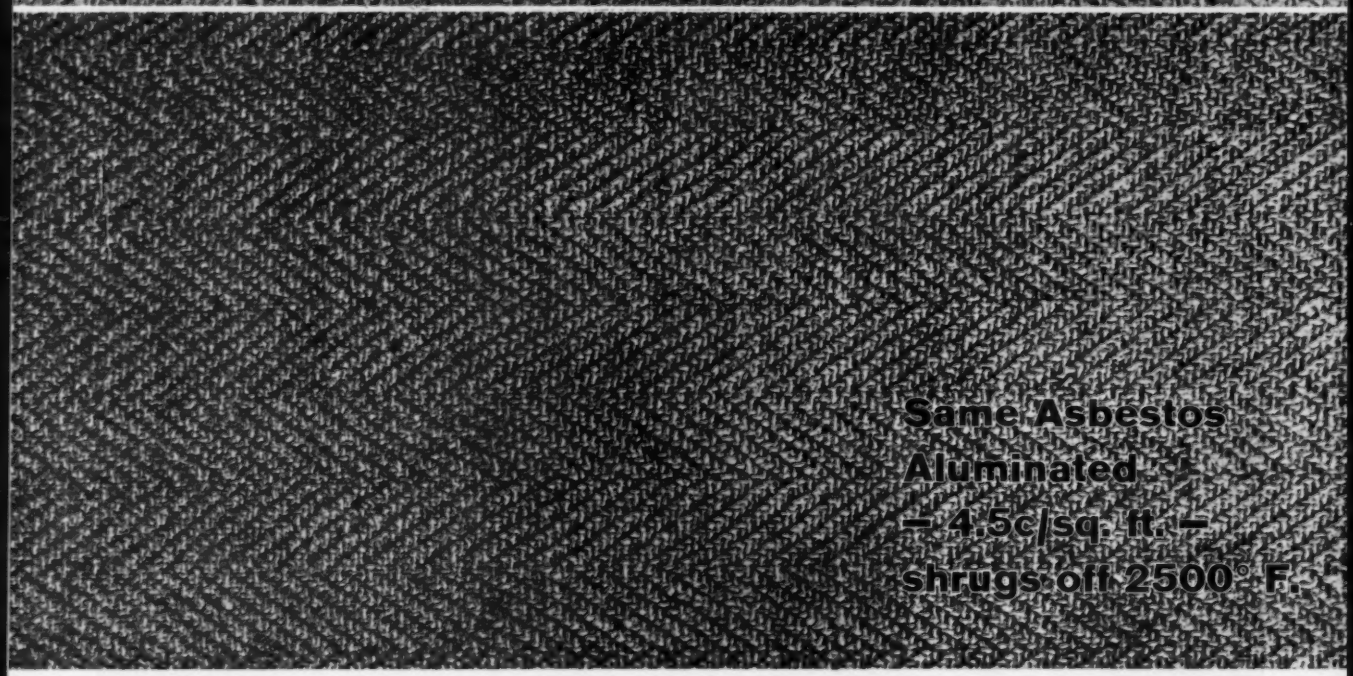


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by Stanley M. Suchecki
*Associate Editor*

**Exclusive**

# PROGRESS REPORT: *printing with the fiber reactives*

COTTON'S enviable position as a fashion fabric has come about through continual technological advances. The first of these was the achievement of dimensional stability, which together with advances in the application of fast colors, placed cotton into a position of high esteem and within economic reach of millions.

In more recent years, the achievement of wrinkle resistance has helped to preserve cotton's reigning position, and the "discovery" of fiber reactive dyes has provided it with colors of high clarity and brilliance. What makes this latter achievement noteworthy is that brilliancy of color is accompanied by wet fastness.

This unique combination of dyestuff properties, never before attained on cotton, soon caught the eye of the alert styling community. Print stylists were perhaps the first to explore the potential of fiber reactives in the style-conscious apparel markets.

Almost unanimously they sought to establish a new styling trend with colorful patterns of high brilliancy on more lustrous cotton constructions. The intent was to simulate a genuine silk-like appearance. Although they succeeded in creating what became known as the "silk look on cotton," much to the amazement of the industry the trend ran a cycle of only one season.

Many reasons have since been advanced to explain this baffling and unspectacular first performance. Perhaps the most plausible reason has come from the stylists and color authorities who hint strongly that brilliancy of shade had little chance of succeeding back in 1958 and 1959, when the trend in styling with muted and dark shades persisted stronger than ever before.

The popularity of the conservative Ivy League styling, with its demands for somber shades, likewise persisted; as did many variations of the India madras school of styling, which ironically enough called for dusky shades with a tendency to "bleed."

In the meantime, print colorists had ample opportunity to examine this new class of dyestuffs, which combined with the fiber by direct chemical reaction to form stable chemical linkages. While the dyes were easily adapted into print shop routines and required little technical supervision in aging, some of the relatively substantive colors presented problems in washing off.

In this last important step, the unreacted portion of the dyestuff (formed by reaction of dyestuff and water) must be removed for best fastness properties. In some instances, even prolonged rinsing failed to remove the unreacted dyestuff completely, led to crocking; while in other instances, removal of unreacted dyestuff was accompanied by staining of white grounds.

At least two other criticisms were voiced by print colorists: A higher cost of printing, often being 5¢/yard more than for printing with "tub fast" colors; and questionable resistance to resin finishing and chlorine laundering.

Perhaps a number of reasons in combination had been responsible for the failure of fiber reactives to set a new trend in print styling. But the strongest reason points to their introduction at a time when the public was not eagerly awaiting a new color trend, despite the fact that color brilliancy was being offered on cotton for the first time. This reason has been borne out this year by a strong resurgence of interest in color brilliancy. Quite aside from such end uses as swimwear, where a place will always exist for this color attribute, the fiber reactives are being utilized in styling sportswear and so-called "cruise wear" fabrics on an increasing scale.

Several stylists in the conservative segments of the drapery field have also indicated a more than casual interest. The belief seems to be growing that color brilliancy is the trend of the day and that it will be in great evidence in 1962.

**Tailored Properties.** In recognition of early problems in applying fiber reactives, important improvements came about. Production runs in printing and dyeing had clearly shown that a specific application required a dyestuff with "tailored" properties and a specific degree of reactivity. This trend in synthesizing dyestuffs and, for that matter, reactive systems is now very much in evidence.

With this more clearly defined goal in sight, the dyestuff manufacturers also began intensive programs of application research to seek out the most effective methods of applying fiber reactives. As a result, some problems have been brought under control, as overcoming the adverse effects of resin finishing.

And at least two novel dyeing techniques have evolved: The cold

pad-batch method, which is simple and economical, being particularly suitable for short runs; and the thermofixation method, which some dyers believe will ultimately become the most popular method of dyeing. For one thing, it is said that it offers a very high color yield; and the reaction takes place quickly in a dry heat atmosphere. Although it requires dyestuffs of very high solubility, these are becoming available in larger numbers.

In printing, the full exploitation of the fiber reactives has just begun. But already their advantages over D & D's as ground shades in discharge printing are known, as well as their advantages in printing both brilliant and muted shades as resists under aniline black.

**Reactive Systems.** The reactive systems available today are all identical in their concept of application. But there are differences in behavior and reactivity, not only among dyestuffs belonging to the same reactive system, but also among dyestuffs of the various reactive systems.

The Procion H and Cibacron brands, however, which are marketed by Arnold, Hoffman & Co. and Ciba Co. are practically identical, being members of the monochlorotriazine group. The straight Procion brands, incidentally, are a class apart, belonging to the dichlorotriazine group, being distinguished also by "cold dyeing" characteristics.

There are two other reactive systems of commercial importance in the States: The vinyl sulfones, known commercially as the Remazols, which are marketed by Carbic-Hoechst; and the tetrachloropyrimidines, known commercially as the Drimarenes and Reactones, marketed by Sandoz and Geigy.

It is of little practical significance to most colorists to know the exact chemical structures of dyestuffs. What is far more important is a knowledge of their fastness properties and their idiosyncrasies in application. It is therefore outside the scope of this article to discuss the differences that exist among the reactive systems and attempt to interpret them from a practical standpoint.

However, it is apparent, in printing at least, that the differences are not critical because some printers are formulating shades with colors belonging to several reactive systems. Though this practice is not generally recommended and must be done with caution, it is resorted to most widely to obtain shades not attainable with colors of a given range.

Such a practice is possible, of course, because all reactive dyes are applied from water solution to form stable chemical linkages with cellulose under the catalysis of alkali, which also serves to neutralize the free acid that is formed during reaction.

**Demands Severe.** The requirements imposed upon a fiber reactive dyestuff are more severe in printing than in padding and exhaust dyeing applications. Certain key properties are absolutely essential.

Among these are a low substantivity for ease of washing off, high solubility, and sufficient reactivity for completion of reaction within the practical time limits of aging. Paste stability is another important requirement since fiber reactives have a tendency to react with water.

Through improvements in their syntheses, by more knowledgeable selection of the chromophoric constituent of the dye (which influences fastness properties and provides brilliancy), and through application research, the fiber reactives are becoming more competitive with other color classes by offering distinct advantages.

To begin with, they are easily solubilized, requiring few ingredients in formulation. Thus, their ingredient cost is favorable by contrast with the vats.

As yet, the industry has not shown an overwhelming preference for a single printing thickener. While there is evidence favoring the use of oil-in-water emulsions, which offer higher color yields, sharper mark, and some colorists say, better running properties, about one-half of the industry still prefers alginate-based thickeners.

One dyestuff manufacturer believes, however, that in the long run the emulsion thickener will come into greater usage because further research will provide it with advantages over alginates which printers will not ignore.

Perhaps the most important advantages of fiber reactives in application are their good running properties on the machine, with easy visibility of the print, and trouble-free aging. No doubt, the application of dyestuffs from a true water solution minimizes the risks of "scumming" and formation of "dry color," common to other color systems. One printer reported that in several large printings with fiber reactives the lots were closed out with a negligible per cent of seconds.

In all likelihood the conventional steam ager will continue as the standard piece of equipment, despite the fact that some results of application research point favorably toward thermofixation.

It is unlikely that a plant would purchase a curing box unless the volume of printing justified such an expenditure. Moreover, the fiber reactives are often printed alongside colors of other classes (some of which also possess high brilliancy) which require steaming for their development.

A disadvantage, or perhaps even a deterrent to the use of fiber reactives at the present time, lies in the need for a longer washing off cycle. Though dyestuffs may possess extremely low substantivity, or may lack it completely, in actual practice it is usually necessary to follow open soaping with a soaping in the rope. At least this is the experience of several printing plants.

No doubt, the efficiency of most open soaping operations could be improved. But it is extremely doubtful if open soaping can ever approach the efficiency of rope soaping, where mechanical agitation is considerably greater and longer and a higher temperature can be more easily reached and controlled.

In normal open soaping operations, unless the water is preheated, a temperature of 140 F is not often exceeded because of the need of constantly replenishing soaping liquors.

*Continued on page 131*

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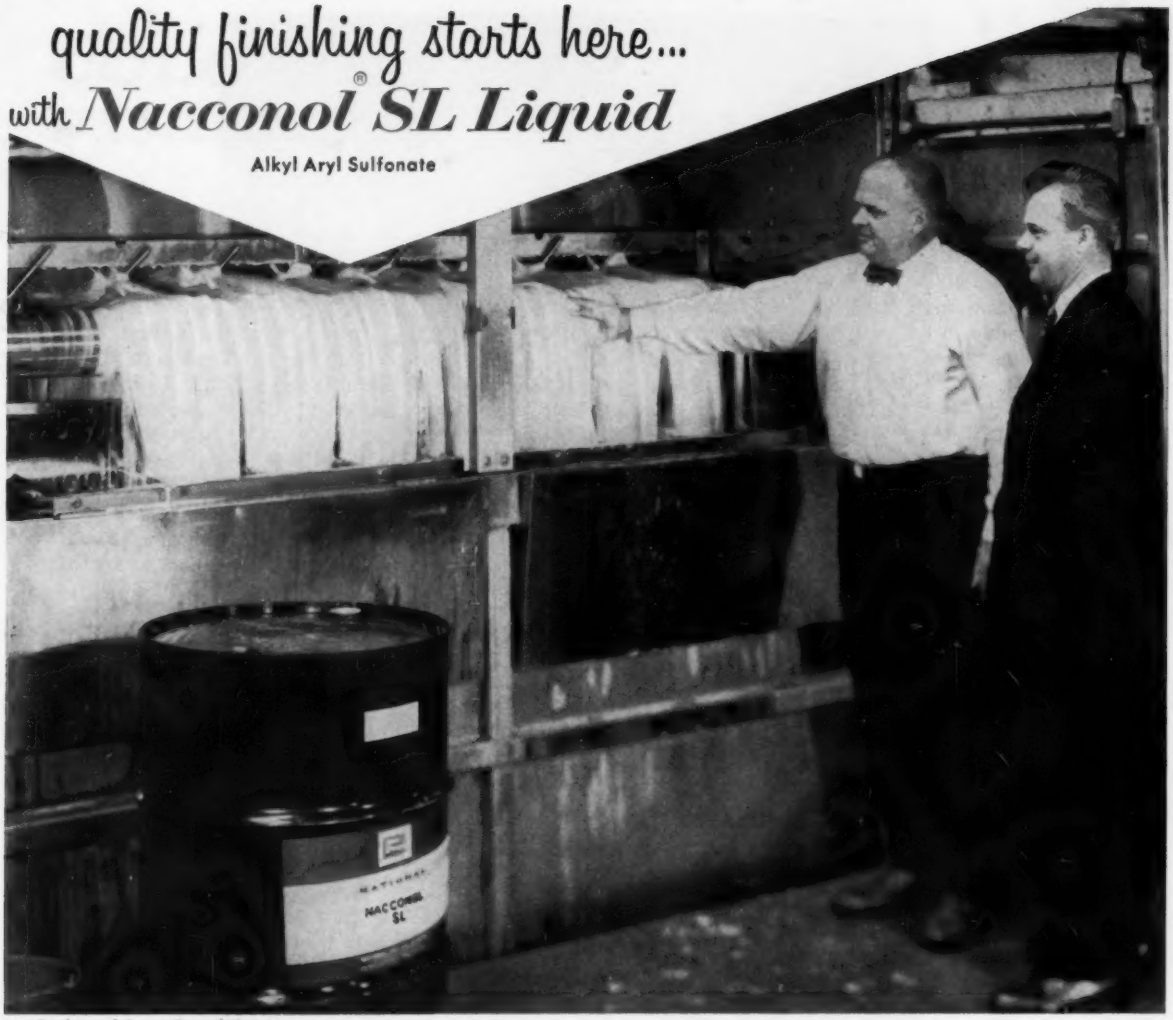


Mr. Stoehr explains to Kenneth Jones, National Aniline representative, why Botany prefers Nacconol SL.

says Richard G. Stoehr,
Vice President and General Manager
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If you need a good liquid surfactant for any wetting, foaming, penetrating, emulsifying, dispersing or cleaning application, you'll find Nacconol SL highly effective and easy to use. We'll gladly send sample and data.

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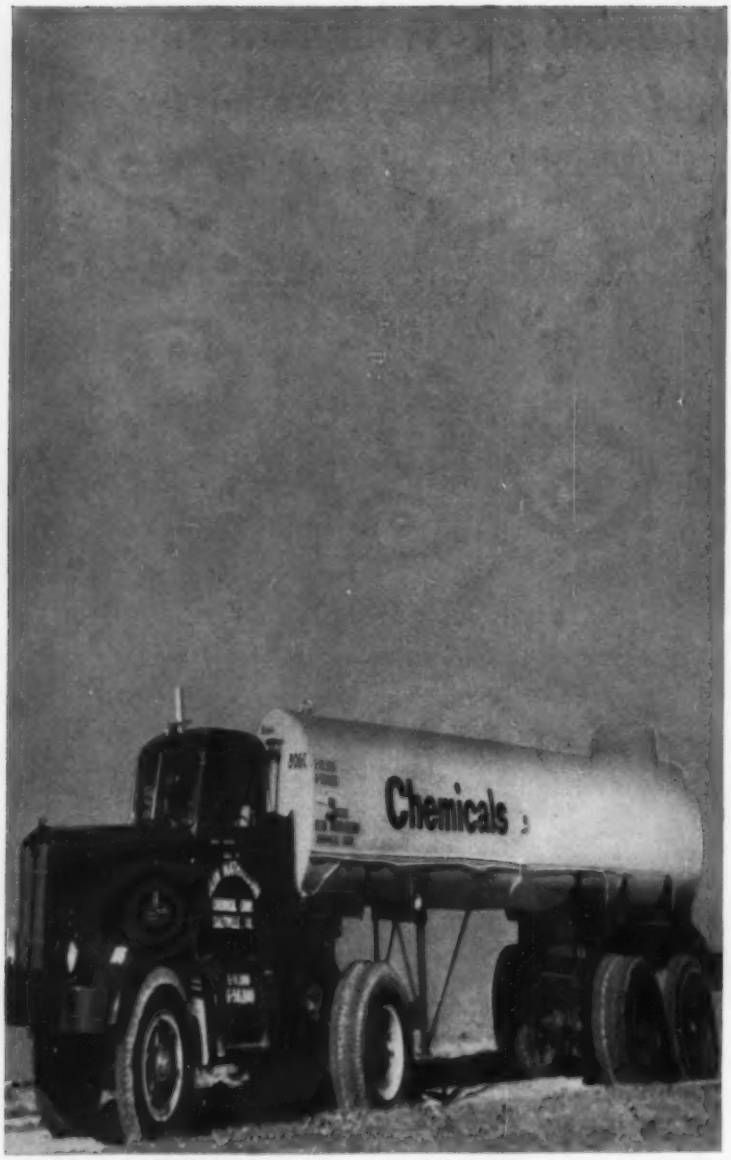


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# COLORING, BLEACHING, AND FINISHING DEVELOPMENTS

**Better Dyeing Synthetics.** Research workers in Japan have described a technique for obtaining better dyeing of nylon 6 and Tetoron polyester fibers by heating to 80-200 C. The improvement is said to be achieved by the production of "electron-microscopic" pores on surface layer of these fibers.

**Coatings for Glass Fibers.** The Air Force has awarded contract to the Westinghouse Electric Corp. for research on special chemical treatments of glass fiber yarns to be used for space vehicles. Investigation of such coatings as the vinyls or urethanes will be conducted to determine the length of time for evaporation of the coatings in vacuum and low density environment of space. Study will also be made of the effect on plasticizers during orbit conditions.

**Bulking Package-Dyed Orlon Yarn.** For restoring the bulk in package dyed Orlon yarns, a practical method described by Du Pont Co. involves passage of the yarn over two opposing knife edges to provide drag with high tension. The yarn is then rewound at low tension and partially relaxed. Complete relaxation and restoration of bulk is obtained in subsequent hot tumbling or steaming of the fabric after knitting.

**New Adhesive Laminating Units.** A Massachusetts concern has introduced a new adhesive laminating machine to handle materials up to 76" in width at average speed of 100 feet per minute. The unit features automatic web guides and tensioning devices as well as a new type, high-velocity dryer. * * * A transfer spreading system for laminating polyurethane foam to fabrics has been developed by Imperial Chemical Industries, Ltd. Called "Daltoflex," it has not yet reached the commercial production stage.

**Silk Yarn Coating Process.** Details have been disclosed of a wax-coating process for doupioni silk yarns said to facilitate weaving and to make easy removal of soil accumulated in weaving. The yarn skeins are treated in a bath containing liquid wax in weak acetic acid. The finish is also claimed to make stain removal from the woven silk fabric easier and to resist at least two dry cleaning operations.

**Yarn Filters for Package Dyeing.** Offered by a West German firm is a yarn filter of special high wet strength paper. The filter is slipped over the dye tube and is claimed to provide uniform dispersion and distribution of the dye liquor around the perforated tube. Coarse dye particles are removed, eliminating the cause of many faults in dyeing.

**Bleaching Cotton Knits.** A Canadian chemical company has reported development of a new process for the bleaching of cotton knit goods with hydrogen peroxide. The process is semi-continuous in operation and is claimed to effect considerable savings in process time and steam consumption.

**Preventing Yellowing of Silk.** Prevention of the discoloration of silk fabrics is claimed for a process originating in Japan. The fabric is immersed in a solution of heavy metal salts, followed by an acid fixing treatment which results in preventing ultraviolet rays from yellowing the material. Strength of the fabric is not impaired, but no information is given concerning any effects on the hand, luster, or dyeability of the treated cloth.

**Glass or Polyester Yarn Fabric Coating.** A new highly fluorinated synthetic rubber coating is offered as a protection for fabrics of glass or polyester yarns against most fuels, solvents, and acids. The coating is claimed to be serviceable at temperatures of up to 400 F, with no cracking at temperatures as low as-100 F. Abrasion resistance is also said to be good.

**New 65/35 Blend.** An Italian firm claims to have a new secret process for treating jute fibers to make them suitable for producing a 65% blend with 35% cotton to yield a light-weight fabric which looks heavy and has the soft hand of silk.

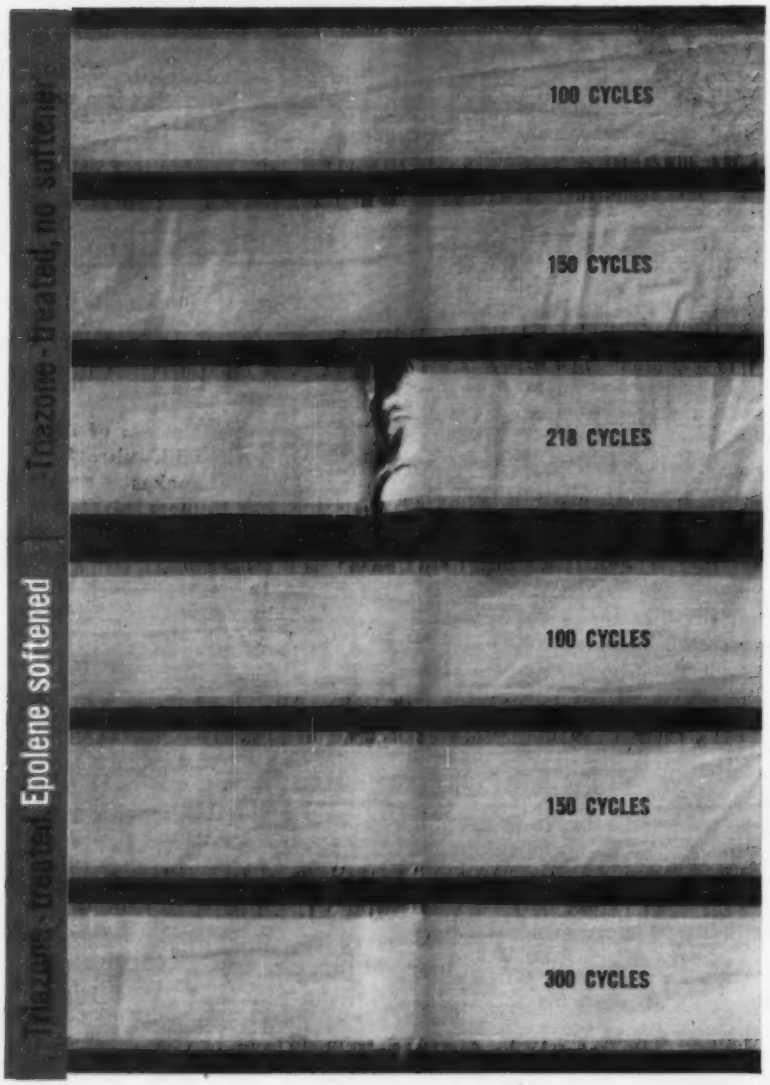
**Antisoil and Antistatic Finish.** Du Pont's "Avitex DCF" is a non-durable type finish to provide static control and soil resistance to hydrophobic synthetic fiber carpeting. It is noted that there is a slight delustering effect on nylon and there might be a small change in the shade of some dyes. Because of patent holdings, royalty payments of about ½ cent per pound are required by Mohasco Industries, Inc.

**Improved Lightfastness of Dyeings.** Treatment with ultraviolet light absorbers makes possible improved lightfastness of certain colors on dyed nylon, Dacron polyester or Orlon acrylic fibers, according to a report recently published by a research worker associated with a chemical company.

**Laboratory-Size Continuous Dyeing Machine.** Manufactured in Germany, a laboratory machine is said to permit dyeings on a small scale in a short time with a minimum of material. Pad box holds about 50 cc of dye and auxiliary chemicals.

**Anti-Oxidant Process.** Westinghouse Electric Corp. is licensing Insuldur insulation, claimed to increase the resistance of cellulosic materials (including textiles) to oxidation, heat, and aging. In-

*The Stoll-Flex Abrasion Test demonstrates the increased strength given to a resin-treated cotton fabric by an Epolene softener.*




**IT** is axiomatic in the textile industry that the finishing resin alone does not a wash-and-wear fabric make. In fact, the variables are many, and often complex.

Of primary importance is selection of the softener. If properly chosen to match the specific type of finishing resin to be used, the combination can provide the optimum in tear strength, abrasion resistance, crease recovery, hand, and sewability for the treated fabrics.

Eastman offers three emulsifiable types of polyethylene resins for use as softeners... Epolene E-10, Epolene E-11, and Epolene E-12. These low-molecular-weight polyethylenes are suitable for either nonionic, anionic, or cationic systems, easily forming emulsions that are stable and low in color.

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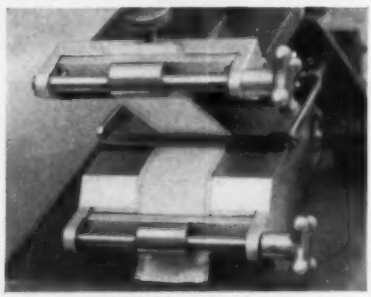

*Stoll-Flex Abrader*

wear resins in use today. These include triazone, triazene, melamine formaldehyde, methylated melamine formaldehyde, dimethylol ethylene urea, and methylated urea-formaldehyde type finishing resins. The results of these test procedures are available to aid you in selecting the right softener for your finishing requirements.

For further information about Epolene textile emulsions, their preparation and use, contact your Eastman representative, or write Eastman Chemical Products, Inc., subsidiary of Eastman Kodak Company, Kingsport, Tenn.

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suldur, itself a cellulosic product thermally stabilized with chemical additives, reportedly can be added at almost any stage in textile processing or finishing.

**New Standards.** Two revised American Standards recently approved include "Colorfastness to Peroxide Bleaching" (L14.58-1960) and "Resistance of Textiles to Mildew and Rot, and Evaluation of Textile Fungicides" (L14.55-1960).

## New Dyes and Chemicals

**Printing Extender.** A new O/W printing extender for Solitone colors has been announced by Solitone Laboratories. It is said to permit complete polymerization of the printed goods at temperatures as low as 185 F. The extender, "Cut Clear LT," permits the printer to cure his goods on steam cylinders or in a neutral ager without any sacrifice in dry and wet crock-fastness, wash-fastness, or dry cleaning resistance. *(J-11)*

**Silicone Water-Repellents.** Two new durable air-drying silicone water repellents are now being marketed by the Silicone Products Department of General Electric Co. SS-4029 is 50% mineral spirits; SS-4053 is 50% perchloroethylene. They are reported to give unimpaired air circulation, improved low-temperature flexibility, increased resistance to oils and greases, increased resistance to alkali salts, water-borne spot and stain resistance, and rapid air drying. *(J-12)*

**Print Lubricant.** "Ecco Printlube," available from Eastern Color & Chemical Co., is designed to prevent colors from running "dry." It also is said to reduce foaming conditions and to minimize tarnishing in roller printing. It softens prints, especially pigment prints that are not soaped after printing. In screen printing, it is claimed to prevent "drying out" of pigments, as well as giving a soft printing area. *(J-13)*

**Plasticizers.** Four new polymeric plasticizers for polyvinyl chloride resins have been added to Emery Industries' "Plastolein" line; they are designated as Plastolein 9722, 9730, 9750, and 9765. Their advantages are said to be improved humidity and outdoor aging, compatibility, better permanence, and good soapy-water resistance. *(J-14)*

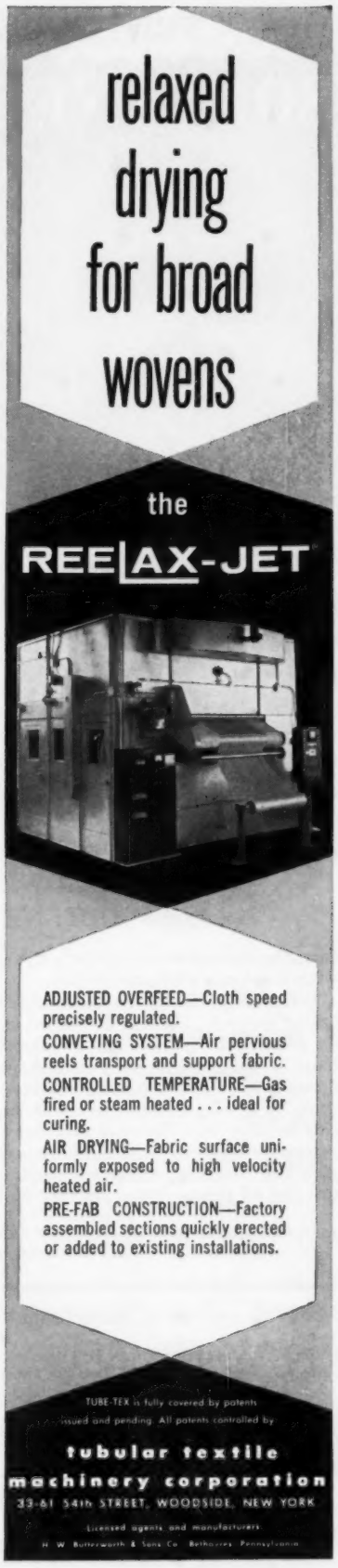
**Caustic Potash.** What is described as an exceptionally pure grade of caustic potash is now available from A. & S. Corp., in pellets and flakes. Sulfates are less than 0.005%; iron and chlorides less than 0.001%. *(J-15)*

**Disperse Dyes.** Four new disperse dyes in the Foron line have been announced by Sandoz, Inc. All are suitable for use on polyester fibers, and are said to be superior in fastness to any available dyes similar in shade. The four are: Red FL ultra-dispersed Pat.; Scarlet BWFL ultra-dispersed p.a.f., Yellow Brown 2 RFL ultra-dispersed Pat.; and Rubine GFL ultra-dispersed. The Red, Rubine, and Scarlet are suitable for high-temperature dyeing. *(J-6)*

**Dyes for Orlon, Dacron.** Sevron Yellow 2R is said by the Du Pont Co. to possess all the properties required of a dye for Orlon, and is also of interest for Dacron. It produces reddish yellow shades, has exceptionally good fastness, good solubility, good hydrolytic stability over a wide pH range, and good stability to high temperatures. Latyl Diazo Black ND has been especially developed for use in the pressure dyeing of Dacron stock, top, tow, and yarn. It is reported to produce black shades economically and to have exceptionally good fastness to light and wet processing. *(J-7)*

**Antisoil-Antistatic Finish.** Avitex DCF is a nondurable finish particularly designed for use on carpets (it is not recommended for apparel). According to the Du Pont Co., it represents a new approach in static control in that it also imparts a good degree of antisoiling; many other antistatic agents actually contribute to soiling. *(J-8)*

**Softener.** Tear strength, napping properties, and sewability can be improved with Avitex Y, a concentrated cationic softener, reports the Du Pont Co. It also imparts moderate antistatic protection to hydrophobic synthetic fibers, and can be applied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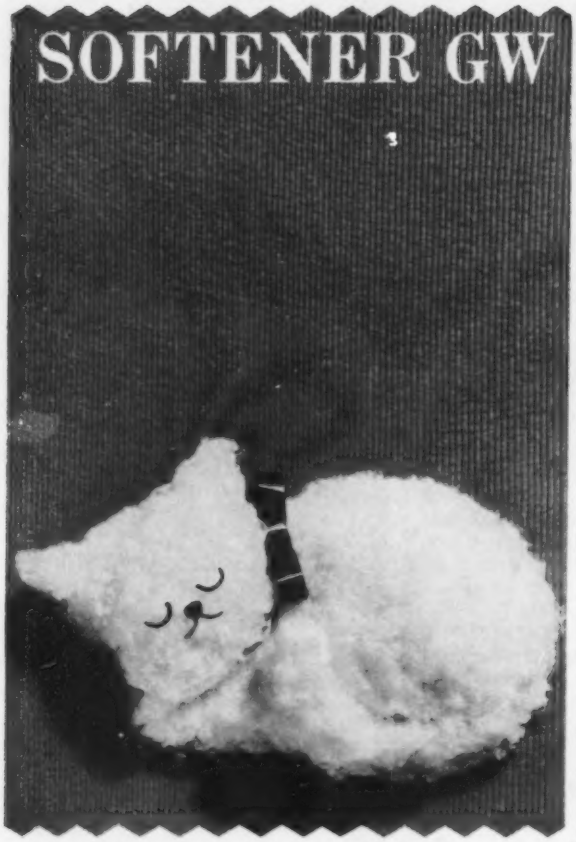

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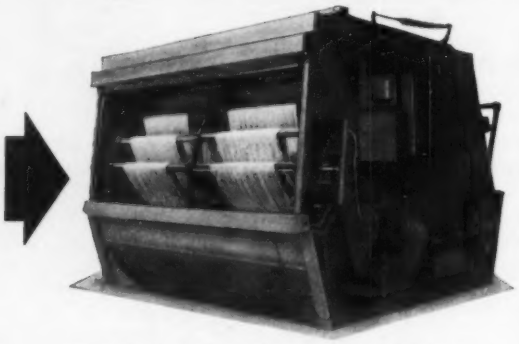

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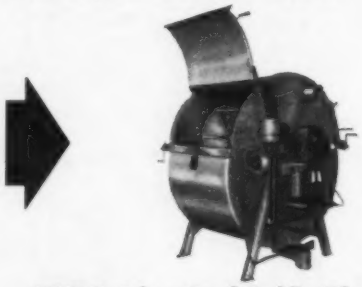

**KWG Stainless Steel Paddle Wheel Machine**

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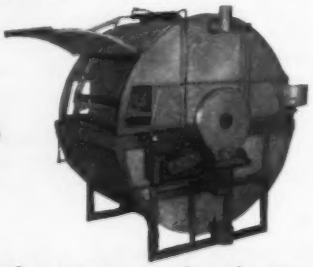

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either alone or with starches, gums, and thermoplastic, thermosetting, or thermoreactive resins. *(J-9)*

**Water Repellent.** Zelan S durable water repellent is a cationic, aqueous dispersion particularly recommended as a finish for all types of hydrophobic synthetic fibers. It can also be applied to cotton and rayon, and is designed for application by either padding or exhaust procedures. It is now available from the Du Pont Co. *(J-10)*

**New Vats.** Black MBA Double Paste and Grey P2R Double Paste are new additions to the Cibanone line of vat dyes available from Ciba Co., Inc. The Black is said to be highly effective in dyeing bloomy black shades on cotton yarns. The Grey was developed primarily as a yarn dyeing color, but is also suitable for application by conventional processes to cotton and rayon piece goods. *(J-2)*

**Antistatic.** "Twitchell 7428 Oil" is designed as an antistatic lubricant for use in the production of popular-price yarns and fabrics, including blends, according to Emery Industries, Inc. It is said to offer effective static control, easy removal, and balanced penetrating and spreading properties. It may be used in all conventional application systems, or sprayed in emulsions as concentrated as 2/1 O/W ratio. *(J-1)*

◆ *For more data on any of these dyes and chemicals, write supplier or use postage-free card at back of this issue, listing in space provided the code (J-1, J-2, etc.) in parentheses at end of descriptions.*

## Fiber reactives *(from page 124)*

**Needed: A Higher Color Yield.** As is well known, mercerization promotes higher color yields and a consequent lower percentage of unreacted dyestuff. The per cent of fixation on cotton fabrics generally does not exceed 70. There is a strong belief, however, that this figure could be increased by more thorough preparation and mercerization. Any significant improvement in color yield would be a welcome contribution. For aside from reducing color costs it would facilitate shade matching, since the change after washing-off would be a less drastic one and hence more predictable.

Whether mercerization at a reduced caustic concentration is more beneficial for the fiber reactives is to be questioned. Such a practice increases yields when dyeing with vats, but it does not enhance luster.

And the fiber reactives are always shown to better advantage in lustrous cotton constructions. This may tend to restrict their use to higher price fabrics rather than to lower quality grades which are not benefited to a high degree (as far as luster is concerned) by mercerization at full strength.

The finishing industry seems to have lost interest in perfecting the art of mercerization for the purpose of obtaining higher luster, relying more heavily on fabric construction, quality of raw material and yarn. The cotton industry as much as the fiber reactives would benefit by a higher degree of luster on lower grade fabrics. At least, it should be made available to stylists.

In discussions with several colorists, the most often repeated criticisms of fiber reactives are their higher cost, their need for a longer washing cycle, already mentioned, and their sensitivity to chlorine laundering which requires careful selection of colors.

No doubt, their cost is higher than that of most vats, for example, but their ease of preparation and the economy of the formulation tend to offset this disadvantage. Moreover, the fiber reactives can be used as "highlight" shades alongside less expensive colors to good effect.

Concerning their sensitivity to chlorine laundering, this restriction would apply only to prints containing a large over-all area of white ground. This restriction might not apply to high quality printed fabrics which in all likelihood are dry cleaned throughout most of their wearing life.

Unfortunately, the decision to resort to chlorine laundering is

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outside the control of the finishing industry. And in the absence of data on consumer habits concerning the use of chlorine bleaches, no conclusions can be drawn here. Not to be overlooked, too, as a powerful influence on this consumer practice is the continual promotion of the virtues of chlorine-containing bleaches.

**The Outlook.** The fiber reactives have probably given cotton an advantage in printed styles over the polyester/cotton blend. For as yet, no satisfactory system has been developed to provide brilliancy on this popular blended fabric. The problems are well recognized.

When fiber reactives and disperse colors are used together in formulation, there is not only the danger of stained white grounds but also of poor fastness to washing. Part of the reason for slow progress in this area has been the reluctance of printers to experiment seriously with so-called "two-dye" printing systems.

The outlook for fiber reactives in printing is not altogether clear at this time, despite advantages in application, as compared with vats, for example. In the diversified print shop, where many color classes are in constant use, these advantages are particularly attractive.

Furthermore, the stability of the fiber reactives is constantly improving, it is claimed, and since they are applied from stable water solution they are unaffected during application by the oxidizing influence of the atmosphere as are the vats.

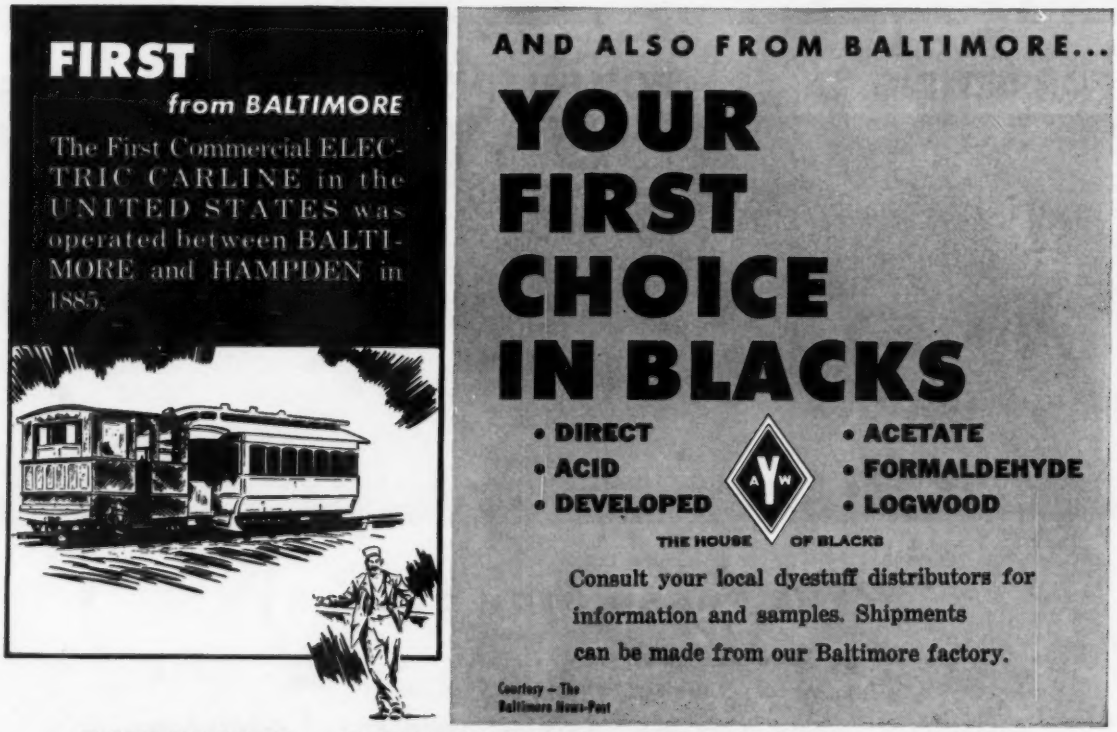
But one reason for some uncertainty about a larger encroachment of printing markets stems from the observation that fiber reactives have found use primarily to provide color brilliancy, which in turn depends for its popularity on the reigning influence in the styling and fashion worlds.

In foreign countries, however, it is interesting to learn fiber reactives are used to a much greater extent in printing to produce muted shades. If such a trend has begun in the U.S. it is not yet a strong one.

In any full review of the fiber reactives, it must be remembered that they have two strong forces working in their favor: An unrelenting research, which is already producing improved dyestuffs; and intensive application research, motivated by competition, to further exploit their chemical versatility and overcome present "bottlenecks."

The printing industry can most certainly recall the ponderous progress of vat printing technologies. By contrast, the fiber reactives have moved at a more rapid rate.

Their weaknesses, nonetheless, may lie in the lack of certain fastness properties, which are deterrents to their use. And because of their higher price they are not getting the second look that they deserve. But this is the expected reaction from an industry perennially caught in a cost squeeze and trying to meet demands of markets at the lowest possible price.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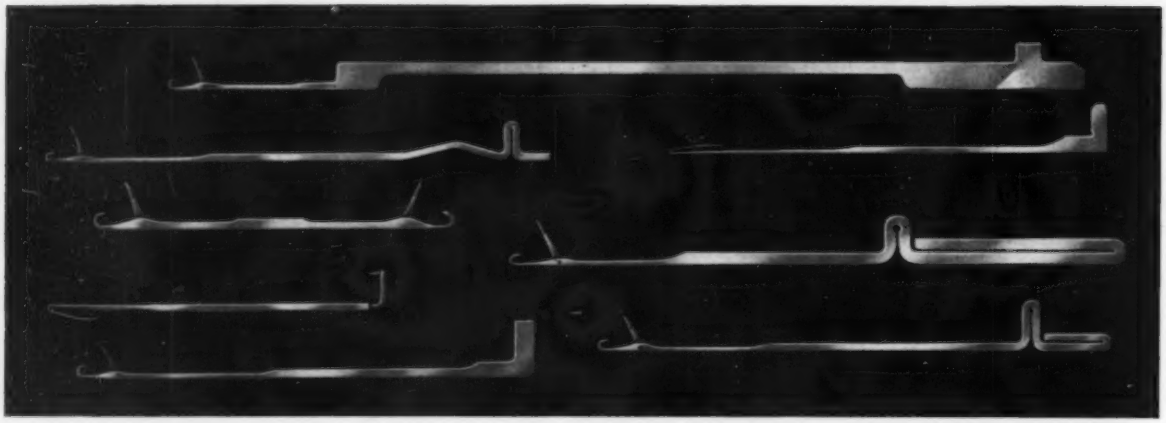

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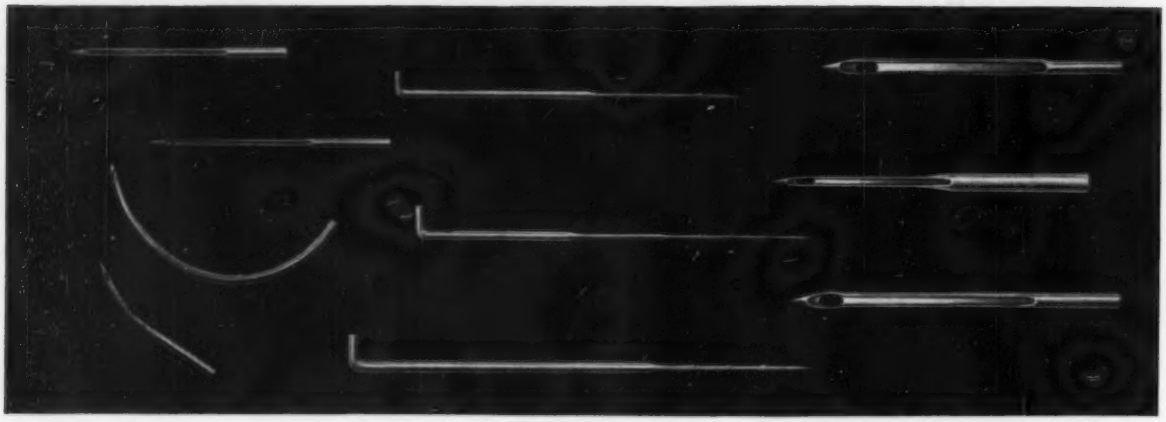

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# KNITTING SECTION

# Yarn tangling on Komets?

***Here's an easily made attachment for the tension bracket that keeps yarn from looping around its parts***

**by K.O. Metz**
**Exclusive**

ON ANY knitting machine there is always a possibility of yarns becoming tangled or looped around yarn guides, yarn tension brackets, and other places in the path the yarn takes from the cone. On some knitting machines the possibility of such trouble is greater because of guide and tension placement and construction.

If and when yarns become looped or wrapped around yarn tension studs or brackets during knitting, the immediate results are additional tension on the yarn being fed the needles. This means trouble, since once the amount of tension on any given yarn is determined, any sudden additions may cause seconds, waste, or a considerable variation in over-all length of goods.

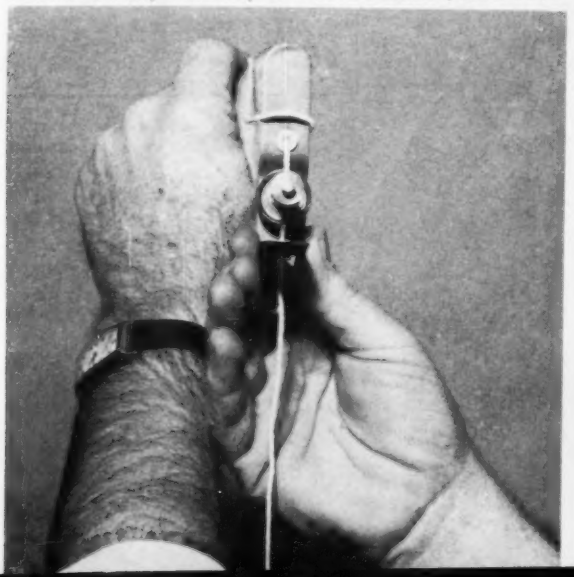
Mostly this kind of yarn control problem comes during heel and toe knitting when the yarn stops feeding completely and starts again during reciprocating periods.

On some types of yarn, the sudden starts and stops will cause it to loop around anything within reach, and here is where additional yarn control becomes important. Certain kinds of yarn require more or less tension to get best results in knitting and finishing.

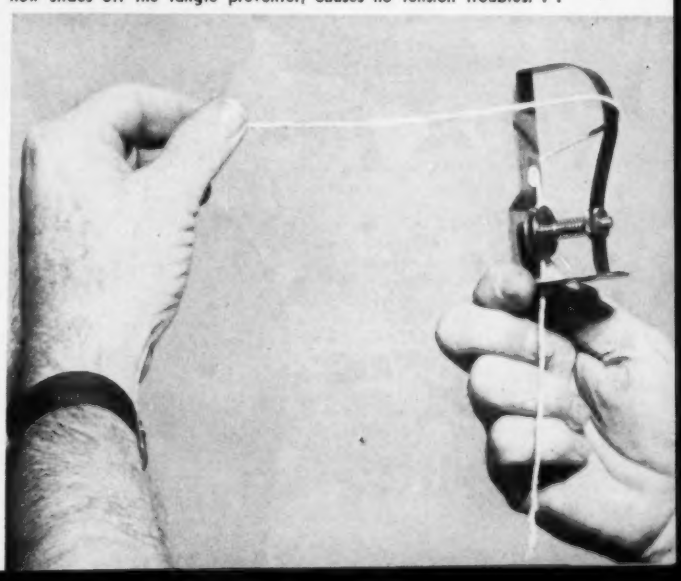
Textured nylon, Acrilan, lamb's wool, and a host of other new yarns will give better knitting results with little or no yarn tension during leg and foot knitting and a limited amount during heel and toe knitting. Shown herewith is a simple addition to a standard yarn tension used on many models of Komet machines.

The necessary materials are

Yarn that normally would wrap around tension bracket, break. . . . .



now slides off the tangle preventer, causes no tension troubles. . .



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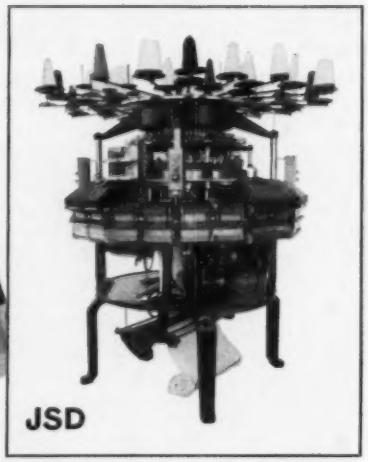


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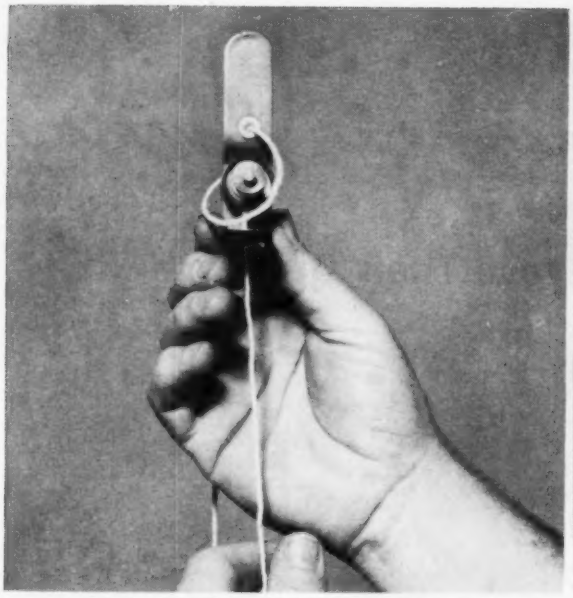
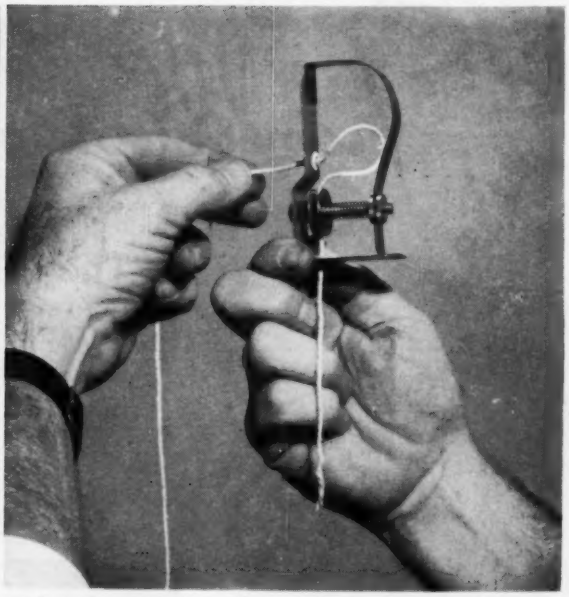
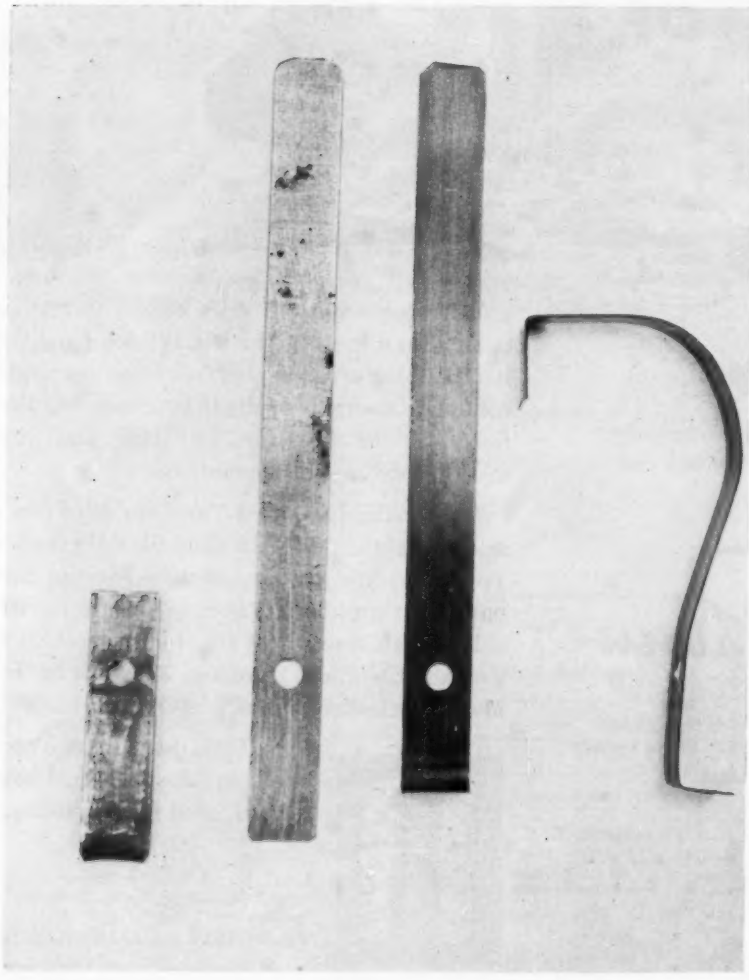


Likewise, yarn that normally would loop around tension stud. . . . .



finds itself contained by the curved piece of carton strapping.



"free"—a piece of strapping from a yarn carton, a bit of ⅛" x ½" x 4" cold-rolled steel for a jig, plus a little labor. Once this simple addition is applied, it will prevent yarn from looping over the top of the tension bracket or looping around the tension stud and thumb screws.

In making the jig, be sure to heat the metal a bright red before bending it. Use a No. 11 drill for the hole and drill it 1¼" from the bend in the jig.

The jig saves time necessary to locate and center punch before drilling, and it also assures each piece being drilled accurately once the hole is located properly in the jig. This simple addition has been in use for a long time on a large number of machines—it costs so little and saves so much.

How the tangle preventing attachment for the Komet yarn tension brackets is made is shown in this photo. Pictured at the extreme left is the jig which simplifies drilling of the hole in the steel strapping. Next to the jig is a straight piece of strapping 5 5/8" long from which the tangle preventer is to be made; the hole at the bottom was drilled by using the jig (first step). The second step is to make a right angle bend in the strapping 7/16" from the end nearest the hole (see third item from left). Finally, shape the strapping as shown at the right for installation on the bracket.

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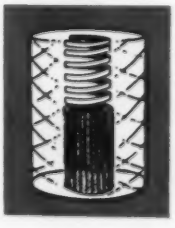

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by Winston Shewmake

Exclusive

# You can repair yarn change levers at the machine

***with this simple tool which can be made at the mill***

YARN change levers on circular knitting machines can be repaired and adjusted easier and faster, with an obvious saving in time and cost, by using a simple tool made in the mill shop. This tool enables the fixer of circular knitting machines (particularly Banner machines) to make certain frequent repairs and adjustments without having to remove the yarn change lever from the machine.

Adjustment of the change levers, by slightly bending those levers, can be tested right on the machine without disassembling the yarn change levers from the lever bracket. Disassembly was formerly the prescribed procedure and consumes a lot of time.

Replacement of a yarn change lever still requires removal of the levers from the lever bracket, release of the carrier ring, and disconnecting and reconnecting the yarn-change lever wires. This is followed by the horizontal leveling adjustment of the lever to clear adequately the hooks of the knitting needles as is shown in *Figure 1* at point N. However, to compensate for wear and lowering of the levers, by undesirable relaxing or bending as shown in *Figure 2*, none of the disassembly is necessary when the tool described herein is used.

The first indication of a faulty or maladjusted yarn change lever is the lowering of the yarn feed lever down onto the hooks of the knitting needles as illustrated in *Figure 2* at point N′. This situation often wrecks a number of knitting needles (sometimes a full set) if the malfunction is not quickly and adequately corrected.

When the yarn change lever is found at fault, correction may be made by simply slipping the special narrow tool over the end of the faulty lever and raising it up to the desired level for clearance.

The tool, which is a narrow handle with a hook attached, is easily made, and it *must* be made thin to allow passage between the extremities of the yarn change levers. As shown at L in *Figure 3*, these lever extremities are very close together, and for this reason

Figure 1

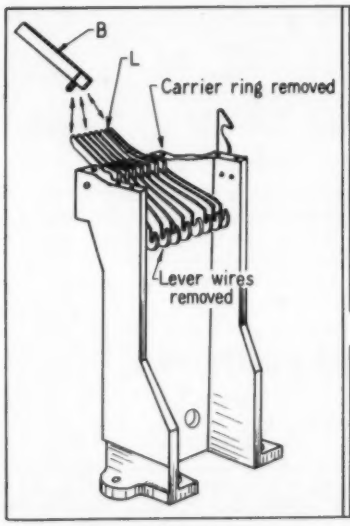
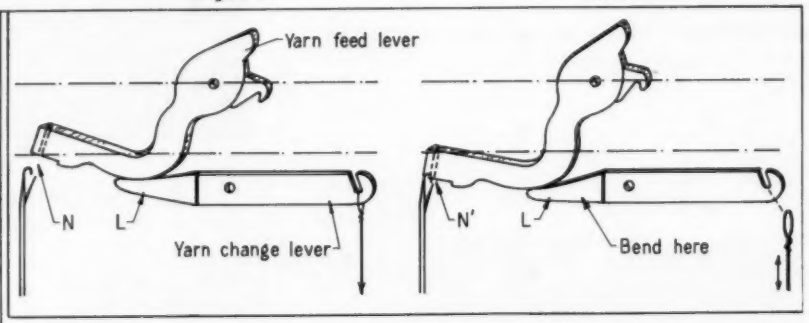



Figure 3

Figure 2



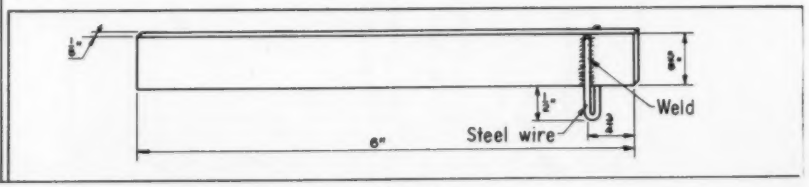



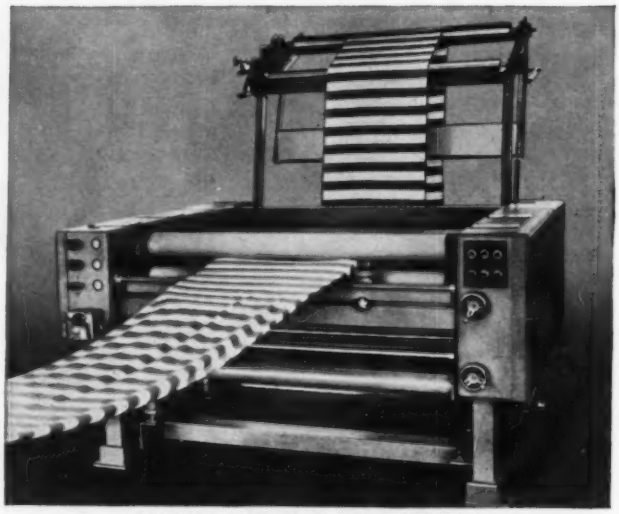

Figure 4

# NEW . . . FROM TURBO

## FOR TUBULAR KNIT GOODS

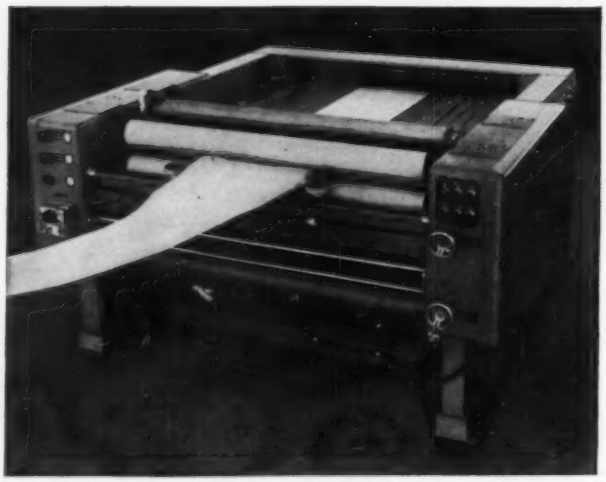
These two new Turbo machines will help you speed production and lower costs, while increasing product quality. In the TURBO PADDER EXTRACTOR for instance, padding and extracting operations are combined in one efficient machine for faster production in sizing, and the application of resins and other finishes. A circulator pump keeps liquor in continuous circulation for even dispersal. In the TURBO FINISHER, fabrics are stretched, steamed and pressed, then rolled neatly or folded. Check the features below, you'll see why you get superior results with both of these Turbo machines.

- Patented spreader-feeder combined with a controlled fabric tensioner attached to press rolls
- Pneumatic loader for more accurate pressure control
- Speeds up to 60 yards per minute, depending on type of fabric being processed
- Fabrics rolled or neatly folded
- Quick-acting safety-bar stops equipment instantly in case of emergency
- Push button controls
- Maintains complete dimensional stability of the fabric
- Nip pressures can be varied to any fabric thickness, including thermal fabrics
- Handle any type and weight of fabric up to 64" wide
- Single, double and triple ends can be finished at the same time



**TURBO PADDER EXTRACTOR**

DIMENSIONS: 118½ inches long. Height, machine: 51½ inches; height, beamer: 102 inches. Width: 97½ inches. Approximate weight: 2200 lbs.



**TURBO FINISHER**

DIMENSIONS: 150 inches long with flat folder. Height: 51½ inches. Width: 97½ inches. Approximate weight: 2000 lbs.

# TURBO

**SEND FOR BULLETINS**

TURBO MACHINE COMPANY, LANSDALE, PA., U. S. A.



*For further information use Handy Return Card, Page 201*

wrenches and other stock tools are not adequate for the job of making adjustments.

To make the tool, proceed as follows: Cut a suitable length of cold rolled steel to form a handle (approximately six inches long) out of flat stock 5/8" x 1/8". From a short length of .050" steel wire, make a complete 180-degree bend around a piece of 1/16" round stock, and leave both ends of the wire at least an inch long. Three fourths of an inch from one end of the cold rolled handle, file a vertical notch 1/32" deep on each side. (Details in *Figure 4.*)

Slip the wire hook ends into the notches, and (in order to form a perfect fit) insert a new yarn change lever into the hook and push up tight against the handle. Maintain this setting without allowing the hook to slip, remove the yarn change lever, and carefully weld both sides of the steel wire hook to the handle *(Figure 1)*.

Any protruding ends of the steel wire above the tool should be ground flush. Then slip the tool onto any of the yarn change levers on a machine (B in *Figure 3)*. It may be necessary to grind the sides of the wire hook slightly narrower if the fitting onto the extremities of the yarn change levers is still tight.

The tool is an asset that will save a lot of time, temper, money.

## Plastic pattern card sealing simplified

■ A NEW ultrasonic sealing machine for plastics and synthetic woven and nonwoven fabrics is generating savings in time, materials, and power for the Wildman Jacquard Co., according to the manufacturer of the sealer.

The basic problem solved for the knitting machine manufacturer involved the need for greater efficiency in the sealing of lengths of Mylar plastic which form the pattern cards or programming belts used to control the operation of many of the machines.

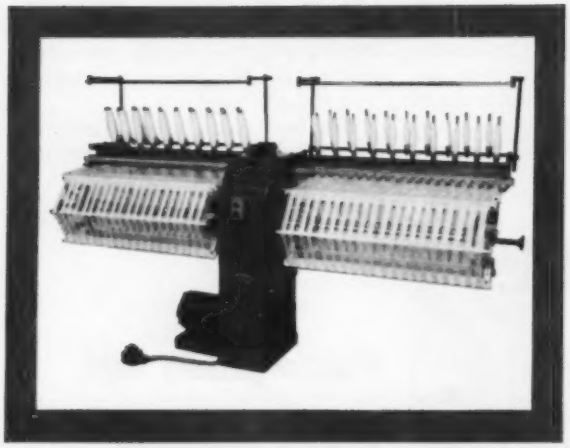
Use of the ultrasonic equipment has cut this time by two-thirds, according to its manufacturer, Ultra Sonic Seal, Inc. The need for an adhesive, electric irons, and power to operate the heating apparatus has been eliminated. Size of the old type seam was one-quarter inch in width. The new bonding method makes an overlap less than 1/32 inch wide. Now, one operator does the work of four, turning out an entire week's output of approximately 2,400 belts.

The Mylar sheets are sealed quickly, noiselessly, and permanently, producing belts capable of undergoing long periods of service. Natural molecular welds are created without deforming, distorting or changing the properties of the Mylar. The Ultra Sonic Sealer does not burn, blister, or otherwise damage the plastic. Any heat produced by the pulsating operating head of the unit is generated internally between the layers of plastic. Outer surfaces remain relatively cold while in contact with the tool. There is no danger of shock or burns should employees come in contact with the mechanism while it is in use.

No time was lost by Wildman Jacquard for giving special training to employees using the sealer, since its operation is simple and easily learned.

Ends of a plastic pattern card are secured on anvil pins (left photo) prior to "welding" by the machine which operates on the principle of high frequency sound vibrations. Right photo: Sealing together of ends is completed.

# PRODUCTION CONTROL



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- 80/1 TRAVERSE RATIO
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- 1" AND 1½" SKEIN WIDTH
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But—best of all—Oakite 202 in mild solutions out-performs strong solutions of other cleaners. This makes it a most economical all-purpose material.

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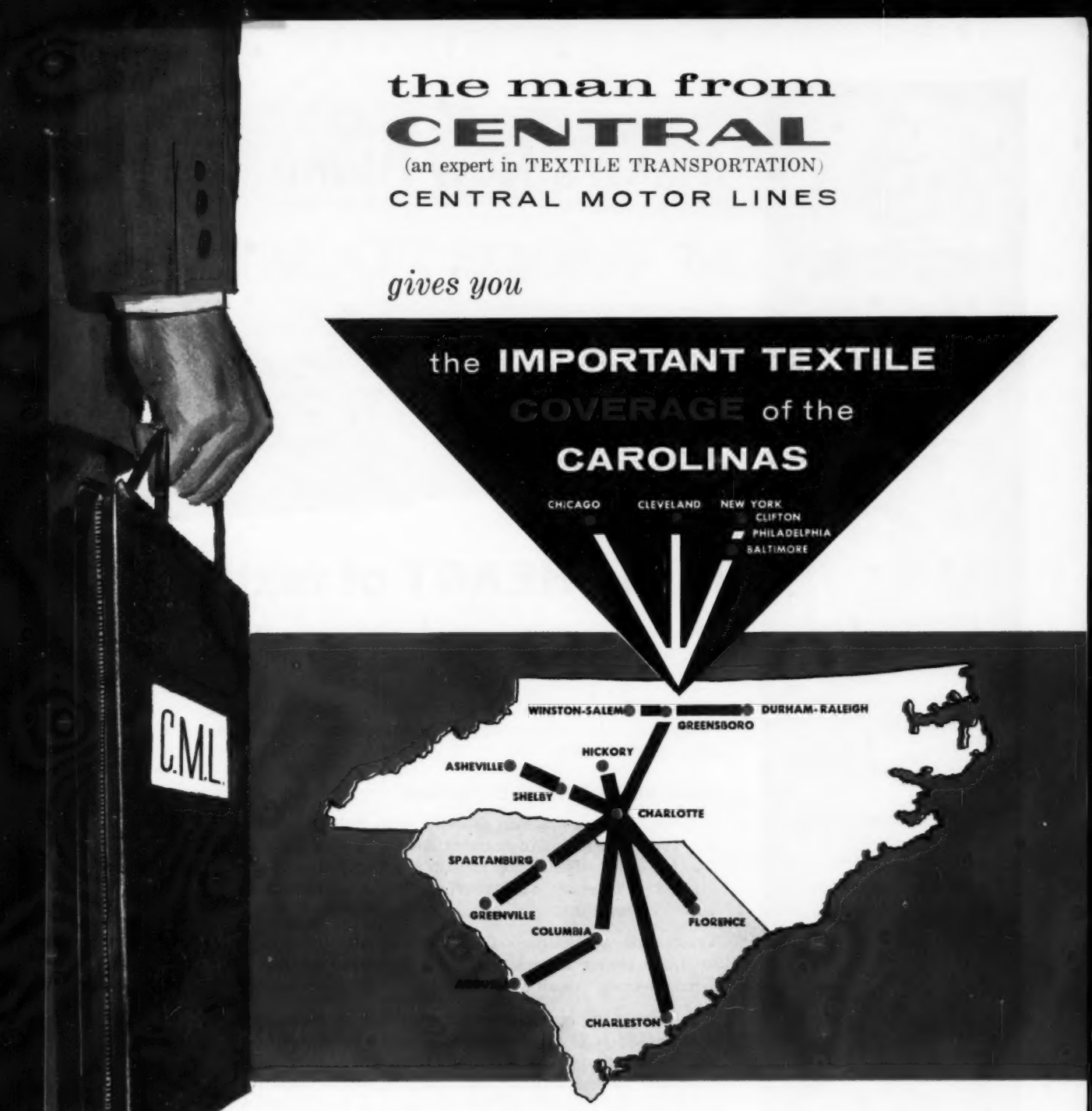


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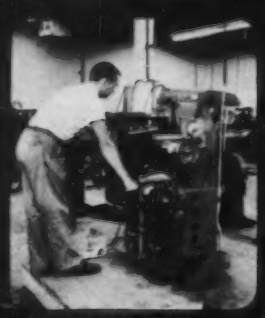
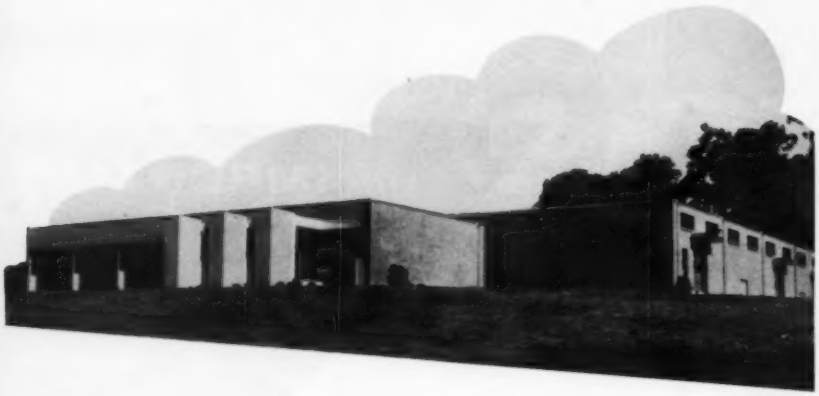


MILLING TOP ARMS

# Dixon's New Home



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*For further information use Handy Return Card, Page 201*

# HOW OTHERS MANAGE

## Check list spells safety in starch cooking

THE EDITORS:

In our company we are quite safety minded and are constantly trying to reduce lost-time accidents. With this in mind, we have compiled the following list of common hazards found in starch-cooking areas:

- ☐ Does your starch bulk-storage system have proper safeguards to eliminate explosion (caused by dust in silo and conveyor), such as use of explosion-proof motors? Have you met the insurance requirements?
- ☐ If starch cooking kettles are on raised platforms, have strong handrails been installed?
- ☐ Are there sturdy rails on steps leading to raised working areas?
- ☐ Are the steps too narrow or steep for safety?
- ☐ Are make-shift, portable steps used (from one kettle to another) which can cause falls and accidents?
- ☐ Is there adequate headroom?
- ☐ Does the size kettle have automatic cooking controls to avoid boil-over of size? Are they in good operating condition?
- ☐ Is the manual shut-off valve too close to the kettle, so there is danger of burns from boil-over when shutting off the valve in an emergency?
- ☐ Are the cooking kettles insulated?
- ☐ Does the cooking kettle have an adequate rear exhaust pipe in case of sudden boil-over?
- ☐ Does the kettle cover have a simple and adequate latch along with a suitable long lever arm to raise the cover for inspection?
- ☐ If the softener is added to the boiled starch, is it melted so it can be piped to avoid splashing and burning the operator?
- ☐ Is the thermoregulator properly placed in the cooking kettle so as to regulate the true kettle temperature and eliminate boil-over? It is possible to have a chart temperature of 160 F when the greater portion of the kettle is actually at the boil. Avoid placing the thermoregulator at the very bottom of the kettle, behind coils, or out of reach of the

## Win $100—Get busy with those ideas—Win $100

**Every kink, short-cut, time-saver, or quality improvement suggestion entered in the contest will be paid for at current space rates immediately upon acceptance, and the $100 award will be made to the winner as soon as all entries are judged.**

**The contest rules are simple:**

**► All contributions must be postmarked not later than midnight, December 15, 1961.**

**► No limit to the number of entries an individual may submit in any one contest.**

**► All entries paid for upon acceptance — no waiting. Extra payment for photographs that are usable. Extra consideration is also given kinks accompanied by legible pencil sketches or drawings.**

**► Entries must not have been published previously and must not be submitted to any other publication.**

**► Send your contest entry to: The Editors, TEXTILE INDUSTRIES, 1760 Peachtree Rd., N.W., Atlanta 9, Ga.**

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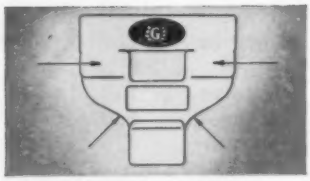

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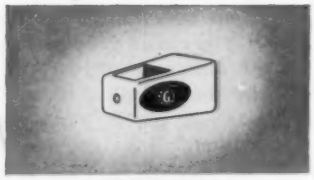

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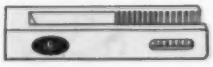

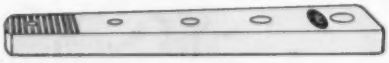

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agitator sweep. The agitator should work within *about an inch* of the thermoregulator.

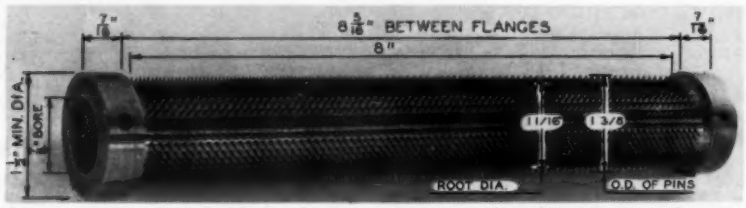
- ☐ If there is air pressure agitation for the starch slurry, in addition to mechanical, is there a shut-off safety valve so that the air pressure cannot be turned on again while the steam is still on so as to avoid boil-over and burns?
- ☐ Is the kettle top at the proper working level for materials addition and inspection?
- ☐ Are there uninsulated hot size pipes which can be accidentally touched?
- ☐ Are there leaking connections on steam lines?
- ☐ Is wet size allowed to remain on the floor or other working areas? It can cause falls.
- ☐ Is the size volume finished off to the very brim? You should always allow 6″ clearance to avoid splashing or boil-over.
- ☐ Are there proper safety valves on all steam lines and drying cylinders? Are they in good working order?
- ☐ Are the mechanical hoists safely positioned?

NATIONAL STARCH AND CHEMICAL CORP.

# How to build your own porcupine drawing

*(The first part of this item appeared in the September issue, page 149. It ends with this installment.)*

This arrangement leaves the brush easily removed for cleaning, an operation performed about every 200 pounds of dirty stock and about every 800 pounds of cleaner stocks.




Flanges or collars at ends of pinned rolls are large enough to keep pins away from the adjacent steel rolls in case a setting slips. The set-over (length of pinned area) must agree with the length of the fluted sections the pinned rolls are to operate against.

It is best to keep extra brushes and change clean ones for dirty ones. Then the dirty ones may be cleaned up and reused without keeping a machine standing or running without brush protection while a dirty brush is made ready. A roller covered with card stripping wire, turning about 150 rpm, and provided with a slide to hold the brush while the assembly is pushed against the stripping roll, cleans brushes adequately. If desired, selvage guides between front and second rollers can be used.

The setting between the front and second rollers is reached by considering draft, fiber length, bulk, and drafting properties such as fiber friction, cohesion, etc.

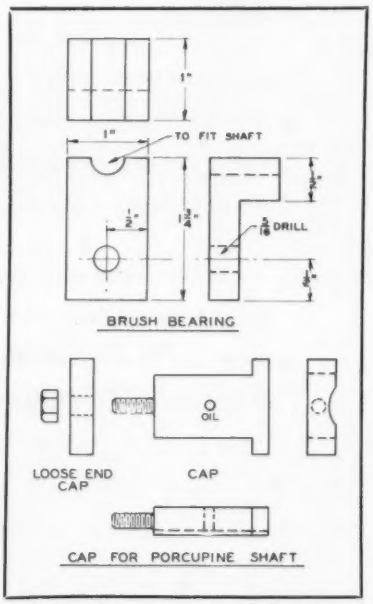
The centers of the back and porcupine rolls are set 1 13/32″ apart; the porcupine and second rolls are given this same setting. But if 1½″ rolls are used, these settings become 1 15/32″. In fact, this latter setting has often proved a decided advantage on the longer staples without being detrimental to the shorter staples.

Close-up of an end of pinned roll. Note angle of pins and setscrews that lock it to 7/8" shaft. Pins act as combs.

The barrel of the porcupine roll (at the base of the pins) is set 1/16″ higher than the plane of the other three bottom rollers. The pin points lag 11 per cent behind the surface speed of the bottom back roll. See Table I.

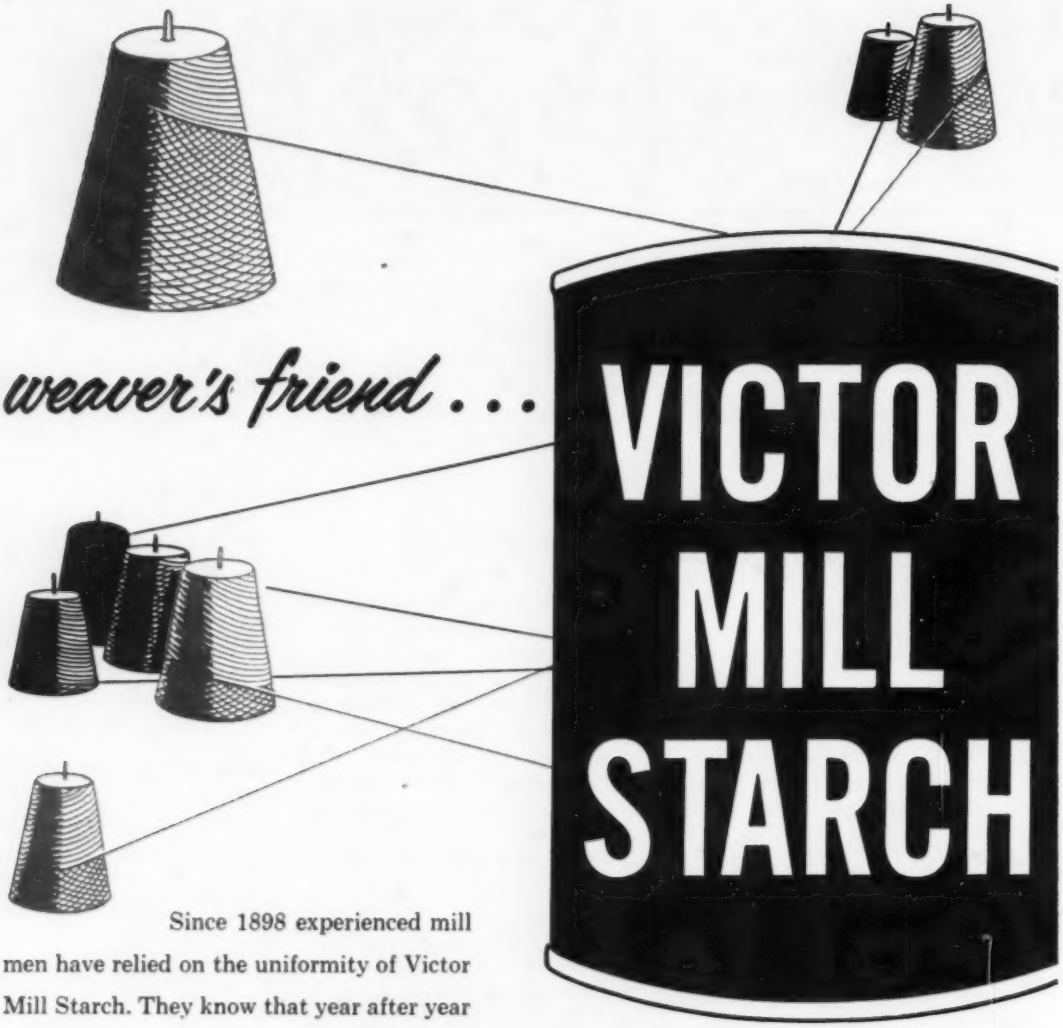
For a nominal machine draft of six, the zone draft arrangements should be 2.5 in the back draft zone (2½″ staple) except when nylon is being run. This draft then becomes 2.2. Likewise, the first drawing should have a 1.2 draft in the back zone when processing 1½″ staple and shorter; 1.15 in the other two lines. Those conditions are the result of many trials, and if followed, they should yield sliver quality second to none.

It is worth mentioning that in working some of the stock having rather low cohesion, there may be a further considerable loss of cohesion, especially following combing — parallelization can be that complete. Using trumpets with bores smaller than those normally used, or applying light spring pressure to the front calender roll will correct for it.




Brush bearing, porcupine shaft cap of pilot frame may require local adapting.

The pinned rolls offer no great obstacle as they may be built to any reasonable specifications. The ones used on the original equip-



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*For further information use Handy Return Card, Page 201*

**TABLE 1**

**Gear Combinations to Give 11% Lag to Pinned Roll**

*(20 pitch)*

| Back Roll Diameter (") | Teeth In Back Roll Gear | Teeth In Pinned Roll Gear |
|---|---|---|
| 1 1/2 | 30 | 31 |
| 1 3/8 | 24 or 32 | 27 or 36 |
| 1 1/4 | 25 | 31 |
| 1 1/8 | 24 | 33 |
| 1 | 24 | 37 |

ment are made of brass barrels with 7/8" bore (see illustrations) by an English firm. Their diameter over the pin tips is 1⅜", and they contain 35 rows of 35 pins each.

Likewise, the brushes may be made to order. The original ones were 2½" in diameter and were made with set-over (pin row length) to match the porcupine rolls.

In mounting these, place them so that the second roll takes the bulk of pressure from the bristles. Then, as the brushes rotate away from the influence of the second roll, the bristles "flick" into action against the fly among the roll pins. Their tips should just touch the barrel of the porcupine roll. Brush pressure against the second roll also pushes the fly deeper into the bristles, lengthens brush cleaning cycle. This pressure generally may be supplied by mounting the brush fulcrum bracket 1/8" to 3/16" off the porcupine-brush center line and toward the second roll.

## Individual bonnets keep lint off roving

THE EDITORS:

In some mills, when spinning higher counts, roving stays in the creel for a few days and collects a damaging amount of fly and lint on the tapered tops of the roving packages. At first we stopped this accumulation by making cones of paper cups and skewering one on top of each roving package. The umbrella worked so well we now use plastic "umbrellas" for the permanent effect.

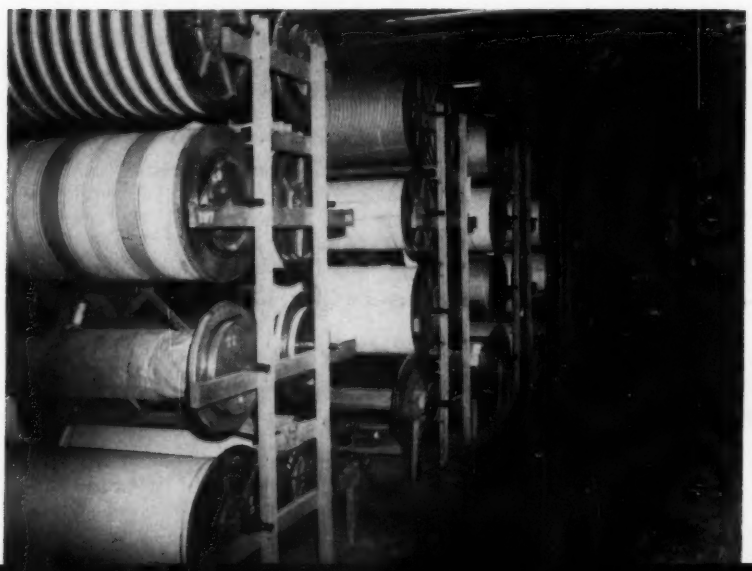
CONTRIBUTOR No. 1335

## Third dimension solves beam storage

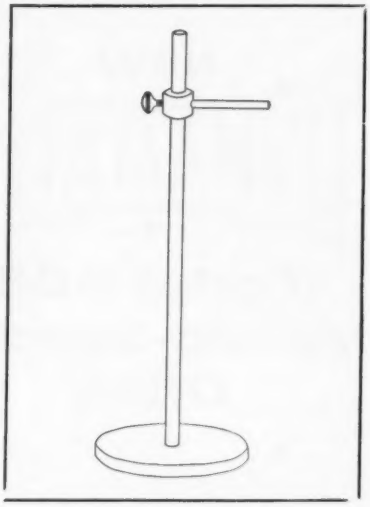
THE EDITORS:

Adequate storage space is at a premium in most mills. One way to utilize all available space is by stacking. These beam racks permit the storage of a lot of beams in a small space. Beams can be moved to or from the racks with electric hoist, overhead track.

CONTRIBUTOR NO. 1329



## Whip-roll height gauge



THE EDITORS:

A gauge that can be used to set all whip rolls at the same height can be made easily in the mill shop of scrap material. A base made of an old gear or gear blank supports a rod that is fitted with a sliding collar. A rod welded to the collar extends over the whip roll. A set screw in the collar can be loosened to slide the collar up or down the rod to the desired height and then locked into place. The setting can then be transferred.

CONTRIBUTOR No. 1315

## Questions on wool processing

THE EDITORS:

I am concerned with spinning worsted yarns, in particular wool of 50s to 70s quality, and mixtures of wool and synthetics. I have been doing some experiments along these lines, and I have a lot of theories I am reluctant to put into operation until I have something concrete to go on.

Situated as we are, it is difficult to compare notes with many people who have done a great amount of research and who have

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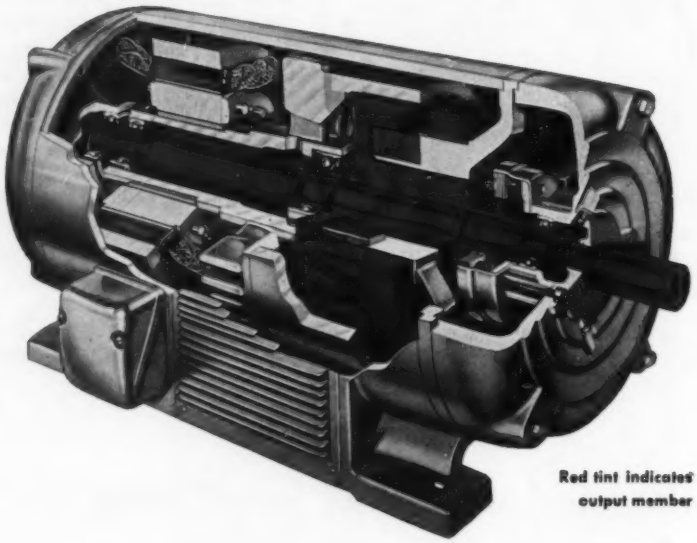
## Model 905 Ajusto-Spede® Drive



Red tint indicates output member

## Extends Capacity Range to 15 HP in the Popular Quill-Type Design

The addition of the new model ACM-905 to the famous ACM-903 and ACM-904 lines of Dynamatic Ajusto-Spede Drives makes the desirable features of Dynamatic Quill-Type design available for many new applications.

Dynamatic Ajusto-Spede Drives provide controlled adjustable speed from an AC power source. Standard control features include on-off clutch control, infinite speed adjustment, constant speed regulation, and jogging. Any of a variety of special features may be easily and economically added to the standard control.

All Quill-Type models are available with either eddy-current, Dyna-torQ, or fail-safe brakes.

An Ajusto-Spede Drive, a control unit (either electron tube or transistorized magnetic amplifier), and a push-button station comprise a compact, easily installed, low-cost drive package.

### Check these Ajusto-Spede® Advantages

- ★ Infinitely adjustable speed from AC power
- ★ Simplified construction
- ★ Compact design
- ★ Wide speed range
- ★ Remote control
- ★ Stationary field coils
- ★ Excellent performance characteristics

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**EATON**

DYNAMATIC DIVISION

MANUFACTURING COMPANY

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For further information use Handy Return Card, Page 201

a means of applying the knowledge thus gained. Unfortunately, the volume of our production does not allow me much time for comprehensive experiments.

My questions relate to 60s, 64s, and 70s wool:

1. What weight of sliver from the Pin Drafter is considered to provide optimum loading for roving frames with F5 and FA12F draft zones?

2. What is considered the best oil content and the best moisture content?

3. How important is back draft on these assemblies?

My company has the Warner & Swasey Pin Drafters followed by Saco-Lowell roving and spinning frames. With regard to the roving frames, we have a number of them with FS4 draft assembly, several with F5, and one with FA12F (double apron). Our spinning frames have SF4 and SF4B draft assemblies.

CONTRIBUTOR NO. 1339
*(Australia)*

*Any advice? — The Editors*

## Boost sales by shading cloth accurately

THE EDITORS:

At a meeting of textile people last spring I discovered to my surprise what little knowledge exists as to problems concerning shading of piece goods where it concerns garment manufacturing. The question came up on how one should go about eliminating shading when purchasing finished piece goods.

The reply was "Purchase goods from reliable firms who sell piece goods guaranteed not to be shaded." We certainly would be most happy if the answer were as simple as that.

We know from experience that some of the large vertical mills pack their white goods 1,000 yards to a case, in order to minimize the shading problem on all staple goods. If this problem did not exist they could very easily pack 1,500 to 2,000 yards to a case which would eliminate packing and extra case expense, and their extra time as well as ours which includes handling, etc.

It is true, however, that some goods coming from some of the bleacheries can be packed 1,500 yards to a case, without too much of a shading problem, but it is seldom that a lot of goods can be put up without running into some kind of a shading problem in one delivery.

If we were to consider all white staple goods, whether it came from a converter or a larger vertical mill or a bleachery, white oxfords would give us the least difficulty in shading.

White broadcloth would be next in line, with a slight increase in problems for shading. Batiste and light-weight fabrics would come next. And to follow this—last but not least—would be the Dacron/cotton fabrics, or any other white-blended fabric (which are notorious for shading within the case, or from case to case).

Concerning white cloth in all synthetics, the problem increases, depending on the type of synthetic fabric concerned. Colored yarn goods are a lesser shading problem in cotton fabrics than piece-dyed goods. From here we go into prints and here our problem increases sharply.

On prints the lighter the motif is printed, the lesser the shade difficulty: on the deeper prints, the greater the problems. This holds true with the goods of printed cotton or printed synthetics.

As an illustration, shades in staple white goods can run in three shades—Shade A, Shade B, and Shade C. Piece dyed goods could run up to five shades, A, B, C, D, and E, especially where darker dyed piece goods are concerned.

Printed goods, which will always run up to as many as three to four shades to a delivery on lighter prints, may run as many as five to seven shades to a delivery on darker, deep-shade prints.

Recognizing that these problems on shading exist, what do we (our firm) do about it? First of all, if shades exist in a delivery, the reputable firms delivering the goods will indicate on the invoice that shades exist.

The person who handles the invoices should be trained to recognize these invoices that have their shades listed and should call the matter to the attention of the department that opens the cases and distributes the goods.

In the event that invoices are received without indicating that there are several shades contained in the delivery, then it becomes a problem for quality control, and these shades must be separated in their various shade categories and this is done with the department that opens the cases and distributes piece goods for cutting.

We place the carton contents in two stacks on top of a table over which lights throw their beams at an angle to the cloth being inspected. We stack the cloth in a way that reflects maximum light and enables us to make quick and accurate comparisons.

Not only are the pieces inspected for shade, but a swatch is cut from each piece of goods and laid up on a blackboard, each swatch from each piece, overlapping the next swatch in order to note the difference in shade, each shade category is selected and placed in that category for cutting in their shade numbers or letters 1, 2, 3, 4 or A, B, C, D, as the case may be.

Each piece of cloth is arranged in that category of its shade for cutting. In this manner, there is a two-way check—a swatch check as well as a piece check.

On white goods and light pastel goods, this is a simple operation. However, when it comes to deep dyed piece goods or printed goods, greater care is taken because the chances are there will be a greater number of categories for shades. Also, the deeper shade goods are checked for shading from side to side, end to end, if in a 12" fold, and often times it is necessary to riffle through some of the folds of some of the pieces to determine whether there is shading in the piece.

Where rolled goods are involved,

the swatches and the rolls are checked for shades and registered in their shade category, and if the shading from piece to piece is extreme, and the number of shade categories are high, as five to six shades to a delivery, then the spreader of the piece goods is advised to watch for shading in the piece from end to end, and from side to side as he spreads. Usually he cuts off a swatch from one end of the table and checking it against the opposite end or in the middle of the spread.

The man who is responsible for shading up piece goods has to be a qualified man who is experienced in determining the variances in shades. He must be accurate as possible in his decisions upon shadings, he must be able to recognize when shading can be expected and this is sometimes when cases are packed in a small quantity of yardage to a case per color. He must be able to recognize quickly piece goods that are shaded within the piece or from side to side, or from end to end, therefore, his background and training must be complete.

A good man in this position can save thousands of dollars for his company—but he also can work out most of the problems concerning shading, lessening the problem, not only for production but minimizing or eliminating claims where it concerns the vendors and mills.

All the various shades in a cutting lot are separated on the cutting table with a thin tissue paper to keep shades in proper order in each bundle for garment assembling.

ENRO SHIRT COMPANY

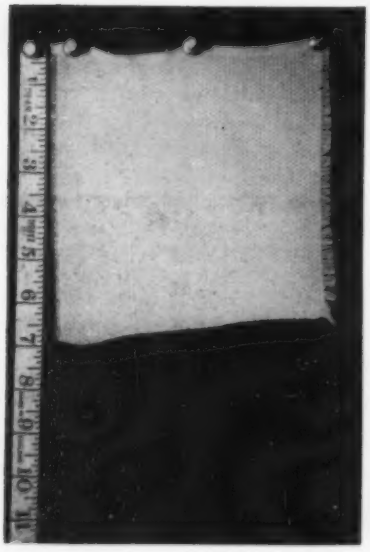
## Are two shuttles REALLY necessary?

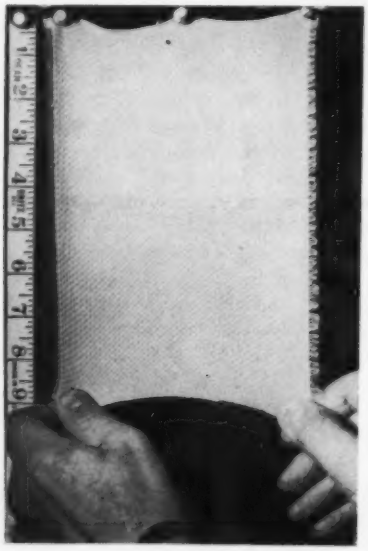
THE EDITORS:

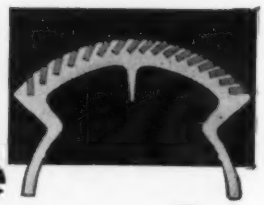
I refer to the woven stretch samples shown in your August, 1961, issue, page 67. All the samples I have seen to date, although they are small in number, seem to have been woven on a two-shuttle loom. The article did not touch on this, so I wonder if two-shuttles really are necessary, and if so, why.

CONTRIBUTOR No. 1338

*(Unless one wishes to mix the filling, we fail to see a need for two shuttles in the work pictured here. What do you think?—The Editors)*



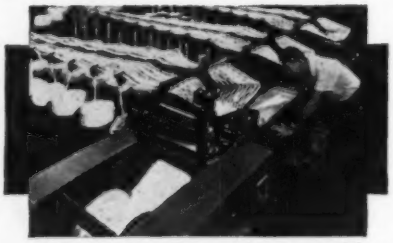


the Super J Comber's "RUNNING MATES!"

The Even-Draft High Speed Drawing Frame plays an outstanding part in the Whitin system for the unsurpassed processing of either carded or combed sliver. It is equally effective for the pre-combing or post-combing operation.

The Whitin Even-Draft operates at speeds up to 600 ft. per minute on carded stock (or 450 ft. on combed), producing sliver characterized by its evenness and uniformity.



The Whitin Super Lap machine offers a completely new concept in the preparation of Comber laps, effectively superseding all earlier lap forming techniques.

This most unusual new machine processes laps of superior quality from either 48 or 60 ends of drawn sliver, with weights of up to 1200 grs./yd.

Its production capacity is approximately 500 lbs. per hour, turning out laps weighing 35 lbs.

WHITIN




For further information use Handy Return Card, Page 201

# NOW!

## get up to 20% more production

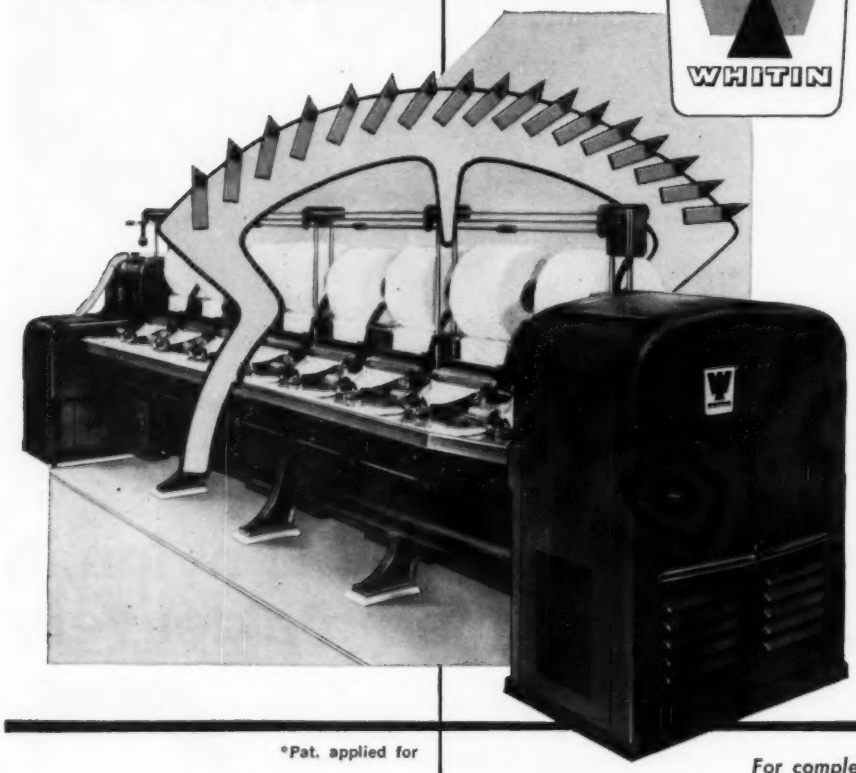
## with the WHITIN Super J Comber

## and the brand new "GOLDEN CIRCLE"* HALF LAPS

**Get full-needle lap penetration and excellent quality combing using 1200 grain laps.**

The Whitin Super "J" Comber has already earned an international reputation for its high production and trouble-free performance — but now, with the brand new Golden Circle Half Lap, its production potential is greater than ever.

The Golden Circle Half Lap is the patented product of Whitin research — an extensive research effort "zeroed in" on one objective only, to design and produce a half lap to excel all others in the "quality" combing of heavy grain laps. On Model J5 and J6 Combers, the Golden Circle Half Lap offers you:



**SPECIAL FEATURES . . .**

- Full-needle lap penetration.
- Lap processing up to 1200 grains.
- Anodized aluminum construction — lighter and stronger.
- Needle strips bonded in slots for greater rigidity.
- Progressive row needle spacing reduces plucking.
- Runs cleaner — stays cleaner.
- Consistent and better nep removal.
- Contoured for better air flow in piecing zone.
- Reduced brush wear.

*Pat. applied for

*For complete information ask your Whitin representative or write direct to us.*

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CHARLOTTE, N. C. • GREENSBORO, N. C. • ATLANTA, GA. • SPARTANBURG, S. C. • DEXTER, ME.

*The best way to better yarns*

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Call on Chemstrand for nylon yarn in the specific modulus your stretch programs require. There are 4 filament counts available in 70-denier for immediate delivery.

It's a Chemstrand exclusive planned to give you the opportunity to sell designers and manufacturers of the widest possible variety of stretch fabrics to suit all needs. With the assurance of perfect fit every time.

Choose from these four filament counts:

**34 filament—low modulus; gentle recovery.**
**20 filament—intermediate recovery.**
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**13 filament—high modulus; fast bounce-back.**

All in 70-denier. Regular or high elongation. And all for immediate delivery. Whatever your needs or problems, consult Chemstrand for expert technical assistance of any kind. Call or write your nearest Chemstrand sales office.

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# Airco Vinol PVA adds the right amount of hand to fabrics

From the glamorous stiffness of this young lady's "tutu" to the softer yet resilient hand required for other wash and wear cottons and rayons . . . just the right amount of stiffness can be added to fabric finishing with Airco VINOL PVA resins . . . sparkling, clear VINOL polyvinyl alcohol is heat resistant. Colors are brighter and stay brighter after many washings, abrasion resistance and tear strength is increased, overall wash and wear characteristics are retained.

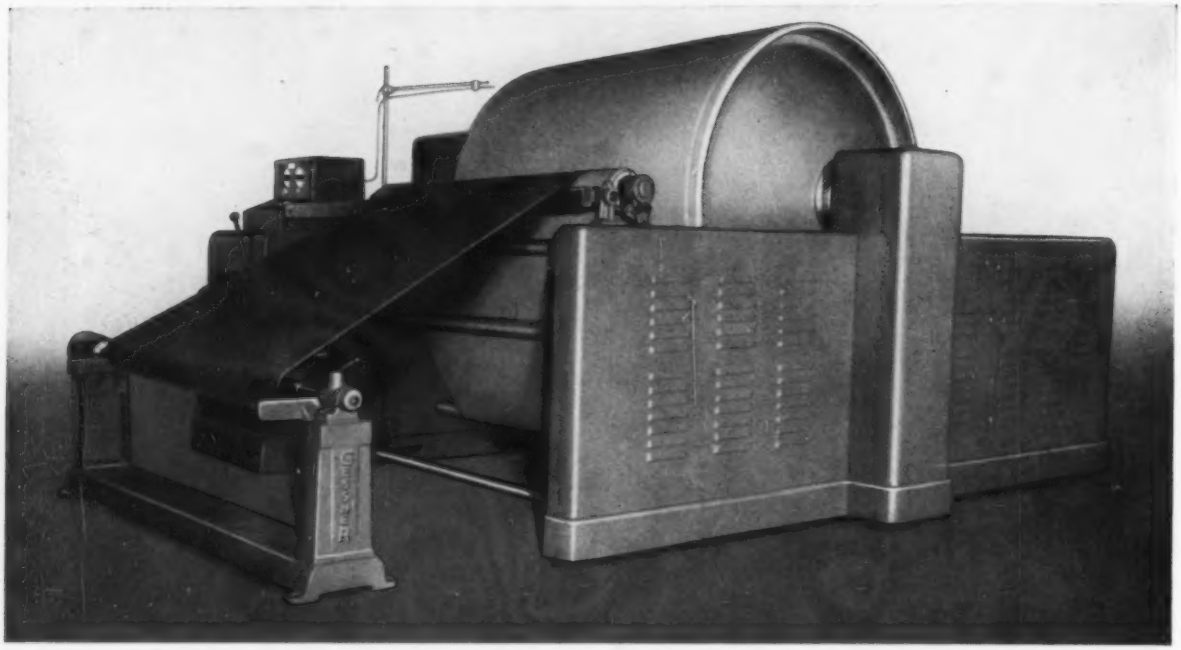
For technical advice and information call the Airco sales office nearest you.

**AIR REDUCTION CHEMICAL & CARBIDE CO.**

A DIVISION OF AIR REDUCTION COMPANY, INCORPORATED • 150 EAST 42nd STREET, NEW YORK 17, NEW YORK • MURRAY HILL 2-6700

AIRCO — Vinyl Monomers, Acetylenic Chemicals / Calcium Carbide, Pipeline Acetylene / COLTON — Vinyl Resins, Copolymers

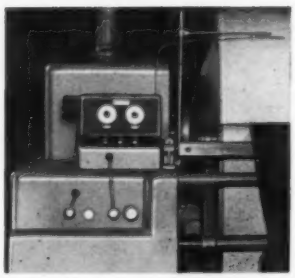
# *Do Your Semi-Decating with a*
# GESSNER VERSAMATIC



*Gessner's 60" Versamatic Semi-Decating Machine.*

Gessner's Versamatic Semi-Decating Machines built with 36", 48" and 60" diameter cylinders, with five important features, combine the utmost in decating quality and quantity.

1. Hydraulic drive and infinite speed variations, and controlled pressure roll; 2. High operating speeds made possible by (a) the automatic apron tension control, (b) the automatic apron guider; 3. Foolproof, internally heated steaming cylinder; 4. Throttle steam with automatic cycle; 5. 60" Versamatic will decate 8 pieces or more of woolens or worsteds, and upwards of 1000 yards of synthetics per loading.



*Hydraulic drive controls and apron guide mechanisms.*

**DAVID GESSNER CO.**

**WORCESTER, MASS.**

Southern Representative:
Richard A. Herard , 222 Piedmont Bldg., Greensboro, N. C.

Western Representative:
E. G. Paules & Co., 1762 West Vernon Ave., Los Angeles, California

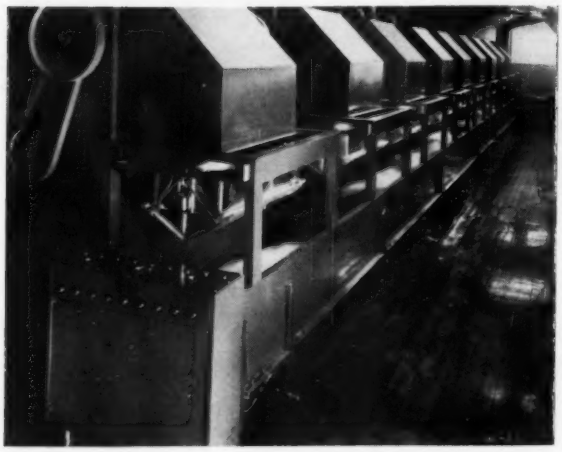
Canadian Representative:
W. J. Westaway, Montreal, Quebec; Hamilton, Ontario



*For further information use Handy Return Card, Page 201*

# NEW PRODUCT PARADE

*Please note: Claims made in all of these announcements of new developments are of necessity based upon information furnished by the respective suppliers.—The Editors.*



## Unit automates fiber blending with old feeders

The Hunter Automatic Belt Blending Conveyor is so designed that it can be used with existing feeders to provide accurate weighing and blending of fibers. The self-contained conversion unit consists of a conveyor long enough to serve all feeders in the line, a weigh pan to receive the stock from each feeder, and an automatic control panel. Hence, conversion can be easily and quickly accomplished on any make of opening room feed hopper.

The equipment completely automates the blending of cottons, wools, and synthetics, reduces ends down in spinning, maintains a higher, more consistent break factor, permits the use of lower fiber grades, and lowers the cost of the blending operation.

Feeders drop stock to be blended into the respective automatic weigh pans which are mounted on the conveyor. An exact, predetermined weight of stock is automatically and simultaneously dropped by the weigh pan at each feeder onto the horizontal conveyor which indexes the full length of the feeder weigh pan between each drop. The sandwiched layers are carried to a single beater or inclined conveyor, thence to a cleaning unit, and finally through a condenser, a distributor, and on to the picker. The entire line is centrally controlled. If one of the units fails to operate, the entire line is stopped automatically, thus avoiding improper blending. Green running lights and red discharge and trouble lights keep the operator aware of the operating status of each unit.

*James Hunter, Inc., Mauldin, S. C.*

**Do you want more data? Write ◂ or use card on page 201; list L-101**

## Lower warp size pick-up with this starch

A new starch for warp sizing produces starch films that are up to 30 per cent stronger than those of conventional starches, and the size solutions made from it are resistant to viscosity breakdown caused by high temperatures and agitation. The high film strength of the product, called HFS Starch, makes efficient weaving practical with lower quantities of starch. The uniform viscosities help maintain consistently high weaving efficiency. Binding qualities of the starch make it possible to obtain higher efficiency in weaving with yarns made from lower grade fibers.

Films of HFS Starch absorb 30 per cent less water than pearl starch, an advantage in mills with spray type humidifiers overhead in the weave room. The starch is found to give an easier dry-split with less rupturing of projecting fibers. Because sizes containing the starch are less cohesive, squeeze rolls raise fewer protruding fibers, and a smoother, better dressed warp is produced. Less shedding at slasher and loom often results.

*National Starch & Chemical Corp., 750 Third Ave., New York 17, N. Y.*

**Do you want more data? Write ◂ or use card on page 201; list L-102**

**Note how the ordinary corn starch at the right has thinned compared to HFS Starch under the same severe mechanical agitation.**

# n. schlumberger et cie

NSC

GUEBWILLER
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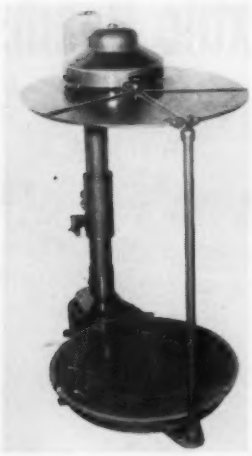
For further information use Handy Return Card, Page 201

## Carefully coils sliver into 30" x 48" cans



Available for cotton or worsted type cards are complete coilers that accommodate sliver cans 30" in diameter and 42" or 48" high. The coil produced is an under-center coil. The number of coils per turn of the base can be changed to give maximum sliver content for a given can without packing.

An auxiliary support at the front assures rigidity without excess weight or bulkiness. Worsted unit has a replaceable Nylatron ring which supports the tube gear and eliminates need for oiling.

*Southern States, Inc., Hampton, Ga.*

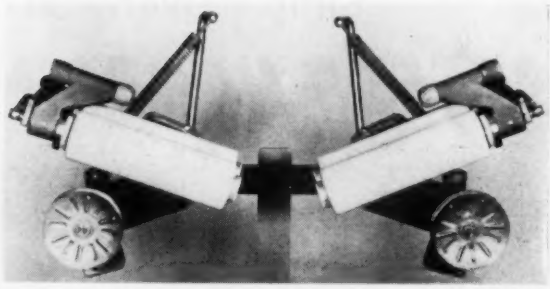
Do you want more data? Write ◂ or use card on page 201; list L-103

## Metal plating and finishing service

A complete metal finishing service for textile plants in the South has been announced. Offered are: chromium plating, nickel plating, zinc plating, black oxide plating, phosphating, Irridite finishes, organic paint finishes.

*Jenkins Metal Shops, Inc., Box 1160, Gastonia, N. C.*

Do you want more data? Write ◂ or use card on page 201; list L-104



## Cloth guiders for mildly acid conditions

Designed especially for wet processing applications where severe acid conditions do not exist are two less expensive models of the Mount Hope Precision Guider. Fabricated of aluminum and cadmium-plated steel and designated Models "A" and "B", they perform in exactly the same manner as the standard Model "S" stainless steel guider, assuring accurate lateral alignment of all kinds of fabrics. Principal advantages of these guiders are: (1) Because the selvage is always in contact with the roll, the rolls are always rotating; this eliminates the possibility of fraying which can occur when contact is lost. (2) Guiders rotate through a continuous rather than a fixed angle; this prevents "jerky" corrective action.

Model "A," with aluminum frame and stainless steel accessory parts and nip roll denippers, is recommended for wet and mildly acid service. Model "B," which is made of aluminum but has some accessory parts made


**For IMPROVED and SPEEDED processing ... with REDUCED WASTE**

**MERROW NOW OFFERS ... *IN A SINGLE MACHINE***

- ***WIDER STITCHING***

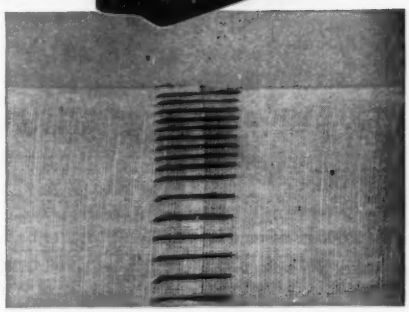
***plus***

- ***MULTIPLE STITCHING AT SELVAGES***

Some processors require a wide butted seam to eliminate "combing out" of coarse material under tension. Others, handling high count materials, need multiple stitching at the selvages for extra strength. Merrow now makes available a machine that fills **both** requirements.

The strong one thread seam (approximately ⅝" wide) is quickly and accurately formed by the high speed machine ... can be easily removed after processing. Result: improved processing ... higher production ... reduced waste.

Style 60 Y3B Butted Seamer



Request complete information on this or other machines in the Merrow **complete line** of butted seamers.

TRADE MARK REG

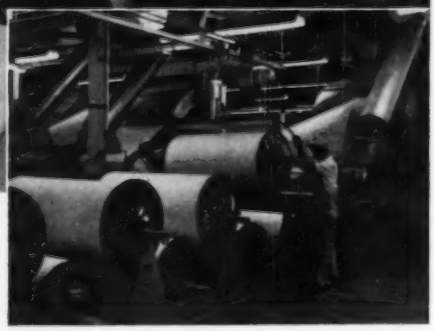
The MERROW MACHINE COMPANY

2805 LAUREL ST. • HARTFORD, CONN. • U.S.A.

## Simple Overhead Tramrail Equipment

# *SPEEDS HANDLING* of Heavy Textile Beams

Although the trend is toward larger diameter beams, there is no problem handling them in a weave room equipped with Cleveland Tramrail cranes. Hand-propelled cranes, as illustrated, roll easily with a very light push.



A Cleveland Tramrail overhead track with hand-propelled carrier and electric hoist make quick work of placing heavy beams into slasher creels. With the push-button-operated hoist, the worker can inch a beam carefully into place.

Simple low-cost Cleveland Tramrail cranes are a tremendous asset to a weave room. They carry heavy loom beams quickly and easily. The aisleways need be no wider than required for a man to walk. Cranes permit increasing beam diameters without widening alleys.

Overhead Tramrail equipment cannot be excelled for handling beams at slashers, warpers, twisters, dyeing machines, etc. Time is saved. Floor wear minimized. Beam damage reduced. Safety improved.

Hundreds of textile mills are profiting with dependable Cleveland Tramrail equipment. Our nearby sales engineers will be glad to work with you on your handling problems.

*Write for free Engineering and Application Booklet No. 2008. Packed with valuable information.*

**CLEVELAND TRAMRAIL**

Overhead Materials Handling Equipment

TARCA TRACK *assures more years of smooth service*

CLEVELAND TRAMRAIL DIVISION • THE CLEVELAND CRANE & ENGINEERING CO. • 288 E. 287 ST. • WICKLIFFE, OHIO



*For further information use Handy Return Card, Page 201*

of cadmium-plated, mild steel, is designed for dry or damp service (it does not have denippers).

*Mount Hope Machinery Co., 15 Fifth St., Taunton, Mass.*

**Do you want more data? Write ◂ or use card on page 201; list L-105**

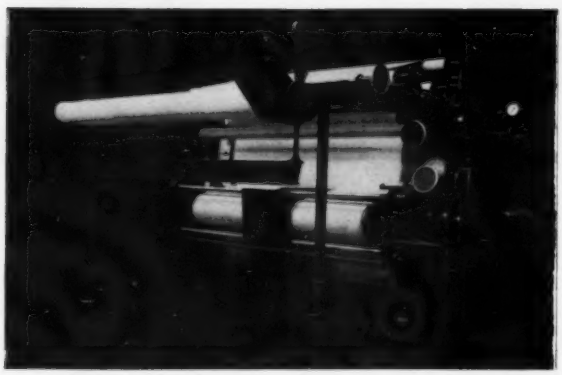
## How to eliminate creases at the loom

Creases at the cloth roll on looms weaving nylon, Dacron, Orlon, or any other synthetic yarn or blend are prevented by the Somaco Smoothee attachment which can be installed in less than ten minutes. Applicable to looms with high or low roll takeup, the device has no moving parts, so no maintenance or adjustments are needed.

*Southern Machinery Co., P. O. Box 3217, Sta. A, Greenville, S. C.*

**Do you want more data? Write ◂ or use card on page 201; list L-106**

## Continuous decating machine



Fabrics are steamed and cooled in one continuous operation on the Raxhon continuous decatizer. Decating is effected between wool felt sleeve of large diameter cylinder and endless felt blanket with adjustable tension to control pressure. Therefore, even and thorough penetration is assured. Two steaming chambers of different sizes are in the lower part of the machine, and they may be used singly or together. Steam valve regulates cooling in upper part of machine before fabric exit.

*Ernest L. Frankl Associates, Inc., 515 Madison Ave., New York 22, N. Y.*

**Do you want more data? Write ◂ or use card on page 201; list L-107**

**breed of cat**

**Aquazine® 100**

Cationic softeners have always had many advantages to processors . . . but let's face it, "cats" have had some "buts", too. That's why Aquazine 100 has so many finishers taking a new look at Cationics. Aquazine 100 exhausts evenly, is non-yellowing, produces superior softness with less material and at a lower cost.

Your MORETEX representative will be happy to give you full details and to arrange for a test in your plant.

MORETEX

CHEMICAL PRODUCTS, INC.

314 W. Henry Street Spartanburg, S. C.

*Manufacturing Chemists For a Half Century of Textile Progress*

CHARLTON WOOLEN COMPANY USES

CHARLTON CITY, MASS.

# HERR "M" TYPE CONICAL RINGS

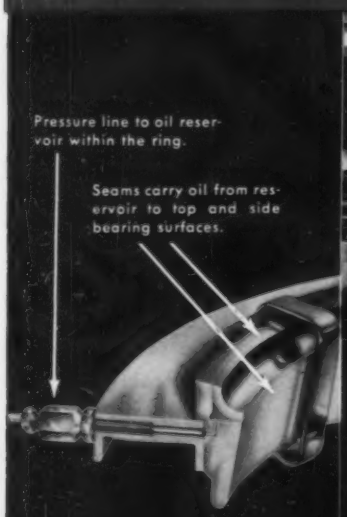
## WITH AUTOMATIC PRESSURE LUBRICATION

For better Oil distribution (minimum amount)
— on the path of the traveler

No oil scattering
— on the machine to create maintenance problems
— on the yarn to degrade quality

**Benefits**

LONGER LIFE OF RINGS AND TRAVELERS
HIGHER SPEED OPERATIONS
IMPROVED PRODUCT
REDUCED OPERATING COST



With Herr "M" Type Rings and Controlled Automatic Pressure Lubrication, "YOU DON'T HAVE TO DEPEND ON THE TRAVELER TO SPREAD THE OIL" says Bob Gard.

Bob Gard, who is overseer of spinning, inspects frames that have been in operation for almost three years.

Illustration shows one of the modern installations at Charlton Woolen Company, Charlton City, Mass., manufacturer of coatings and snow suiting fabrics.

Here's how the system operates: Herr "M" type conical rings contain an oil reservoir running completely around the ring. From this reservoir, seams carry the oil by capillary action to the top and side bearing surfaces of the ring so that the paths of the traveler are continuously lubricated... but with a minimum of oil.

The reservoir is supplied with oil by an automatic pressure system that can be set to give just the right amount of oil . . . eliminating troublesome waste.

After the pump cycle has been established, no supervision is needed. Higher speeds and improved products are possible.

**HERR MANUFACTURING CO., INC.**

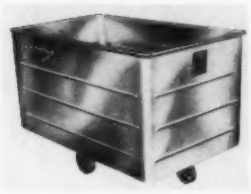
**310 FRANKLIN STREET • BUFFALO 2, N.Y.**

For Spinning and Twisting Worsted • Woolen • Rayon • Nylon • Orlon • Fiberglass and Blended Yarns of all Types



*For further information use Handy Return Card, Page 201*

## Dyehouse utility truck

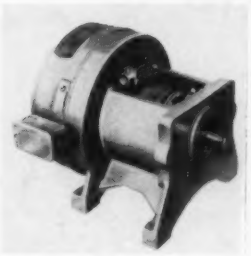


A new dyehouse box truck is designed specifically for ease of maneuverability and full protection of fabric or garments. Manufactured of all-stainless steel with reinforced bottom, the standard size measures 32" wide x 54" long x 27" deep. Special sizes are available for special requirements.

*Klauder Weldon Giles Machine Co., Adams Ave. & Leiper St., Philadelphia 24, Pa.*

**Do you want more data? Write ☁ or use card on page 201; list L-108**

## Fast start-stop drive for looms, etc.



A power supply recently introduced for looms and other machinery with pulsating loads utilizes kinetic energy to attain maximum speed almost instantaneously and to meet momentary peak load requirements up to ten times average power requirements. Called the "Vari-Power," the drive includes a high inertia rotor and an integral clutch-brake coupling. The compact axial air gap motor weighs 30% less than a conventional motor of equal horsepower. The unit's timing cycle can be actuated through an adjustable time delay relay. Applying the brake by use of a position indicating switch on the driven portion of the machine allows its use as a simple positioning servo mechanism. Through rheostats the unit may be adjusted for slip clutch usage in web tension controls and other applications requiring simultaneous engagement of clutch and brake.

The constantly spinning rotor of the drive, which is available with horsepower ratings of ⅓ to 7½, achieves a flywheel effect to store kinetic energy and prevent regeneration.

*Ferguson Machine Co., 7818 Maplewood Industrial Ct., St. Louis 17, Mo.*

**Do you want more data? Write ☁ or use card on page 201; list L-109**

## Handy buckle for rayon cord strapping

One-piece, galvanized steel buckles for use with "Avistrap" Cord Strapping are quickly and easily applied without tools to all types and sizes of cartons and packages, assuring at least 90 per cent joint efficiency. Settling loads may be re-tensioned with certain one-

typical problem materials successfully handled by a MOYNO . . .

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| Acetates | Concrete Slurry | Paints |
| Acetic Acid | Copper Nitrate | Paper Pulp |
| Acid Mine Water | Creosote | Pickling Acids |
| Alcohol | Cutting Oil | Printing Inks |
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| Aluminum Sulphate | Drilling Mud | Resin Plastic |
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| Asphalt | Fuel Oils | Sewage |
| Barium Sulphate | Fuming Sulphuric Acid | Shellac |
| Bichloride of Mercury | Gasoline | Shrimp |
| Boiler Feed Water | Glue | Soda |
| Bordeaux Mixture | Hydrochloric Acid | Starch |
| Carbon Dioxide | Impregnating Compound | Sugar |
| Carbonic Acid | Lacquers | Sulfurous Acid |
| Calcium Chloride | Lard | Tar |
| Caustic Soda (lye) | Latex | Turpentine |
| Cement | Match Head Compound | Varnish |
| Citric Acid | Molasses | Vinegar |
| Clay Slurry | Nickel Sulphate | Wood Pulp |
| Coffee Grounds | Nitric Acid | Yeast |

**MOYNO® PUMPS**
***turn problems into profits . . .***

Many materials, once considered "unpumpable," are now successfully handled by Moyno Pumps. Moynos move thin watery slurries, non-pourable abrasives, gnawing corrosives or suspended solids up to 1⅛" dia. A wide range of specially-resistant pumping element materials assures proper design for economical handling without excessive pump wear. Capacities from 1/100 to 500 GPM; pressures up to 1000 PSI. Write for new Bulletin 100-TI

**ROBBINS & MYERS, INC.**

*Moyno industrial pumps, motors, household fans, Propellair industrial fans, hoists*

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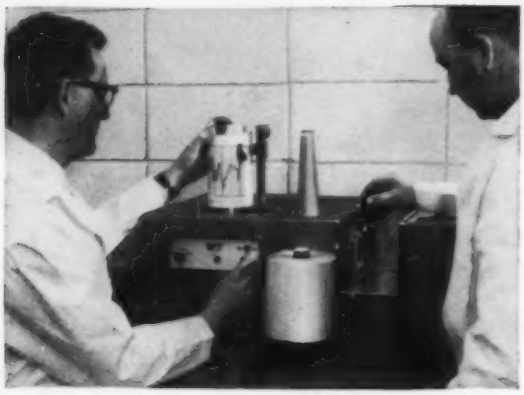
# Yarn carrier research...

## *only at Sonoco!*

The *only* yarn carrier research facility in the world is located at the Sonoco plant in Hartsville, South Carolina. Here are the scientific and technical specialists, the modern equipment and the experience needed to solve yarn carrier problems.



Through the years, most major improvements in the area of textile paper carriers can be credited to Sonoco. Progressive development from the crude, handmade paper cone of 1899 to the close-tolerance, machine-made product of today is typical of how Sonoco has kept pace with the technical advances of the textile industry.

Continuous research at Sonoco covers all phases of manufacture and end use of paper cones, tubes, cores and spools. Every effort is directed toward developing products for use in producing better textiles at lower cost.

Every Sonoco product has this extra ingredient of research background, representing more than 60 years of progress. *Only Sonoco,* in its field, has the necessary experience and integrated production facilities to continue this service for the textile industry. *You can always look to Sonoco for technical assistance in the field of paper carriers.*

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**Products for Textiles**

sonoco

3096

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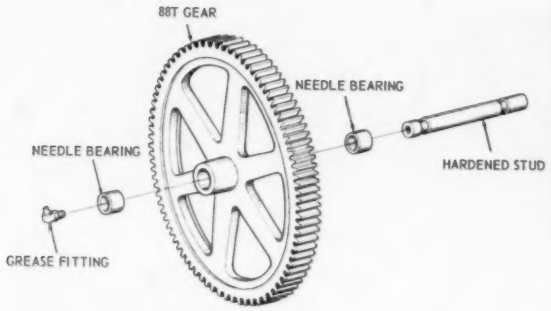
*For further information use Handy Return Card, Page 201*

piece tools, thus eliminating any possible need for re-strapping. Reusable, the buckles can be used on any area of a package. Precutting of strap is not necessary.

*American Viscose Corp., Industrial Packaging Dept., 1617 Pennsylvania Blvd., Philadelphia 3, Pa.*

**Do you want more data? Write ☁ or use card on page 201; list L-110**

## Improved idler gear for C&K looms




Now available for C&K W-3 and PAPA looms equipped with all-purpose takeup is an improved 88-tooth idler gear which is recommended for weaves imparting heavy loads to the takeup mechanism. It features needle bearings running on a hardened stud and provision for grease lubrication; hence, longer, maintenance-free service is provided. The gear can be substituted for original takeup parts without necessity of machining.

*Crompton & Knowles Corp., Worcester, Mass.*

**Do you want more data? Write ☁ or use card on page 201; list L-111**

## High speed tricot knitter has crankshaft drive

With quality synthetic yarns the 168"-wide Mayer Super-Rapid K-2 tricot knitting machine makes conventional tricot jersey cloth at the rate of 900 cpm. Weekly (144 hours) production of the two-bar, 28 gauge machine on a 55 denier acetate is about 2500 lb. A single crankshaft drive is one of the construction features; others are: cranks run in oil bath, roller bearings at point where shafts oscillate need lubrication only once a year, positive mechanical let-off; beams with flanges up to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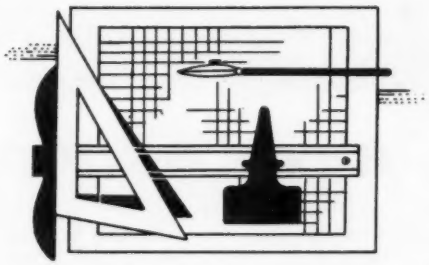
**QUALITY WORKMANSHIP FOR ALL INDUSTRIES.**

JENKINS Engineered Products are engineered by men who for nearly half a century have pioneered improved metal products . . . for mills and manufacturers that have moved forward with quality products and merchandise.

JENKINS covers the entire Textile Industry in the manufacture and sale of textile sheet metal parts and general sheet metal fabrication, stampings, machine work, plate and structural fabrication work. JENKINS, also, solicits inquiries from all industries requiring their services which have been greatly diversified, including Stamping and Contract Manufacturing.

For example, JENKINS Metal Shops now are sole manufacturers of a new aluminum carrying tray for hospitals that has national recognition and distribution.



JENKINS Engineers are now pioneering the "even-better" products of the future. To be sure you're getting the *newest* advantages *first*, standardize on JENKINS Engineered Products.

Your inquiries will be greatly appreciated. Estimates given on any special job. We can give you prompt service.

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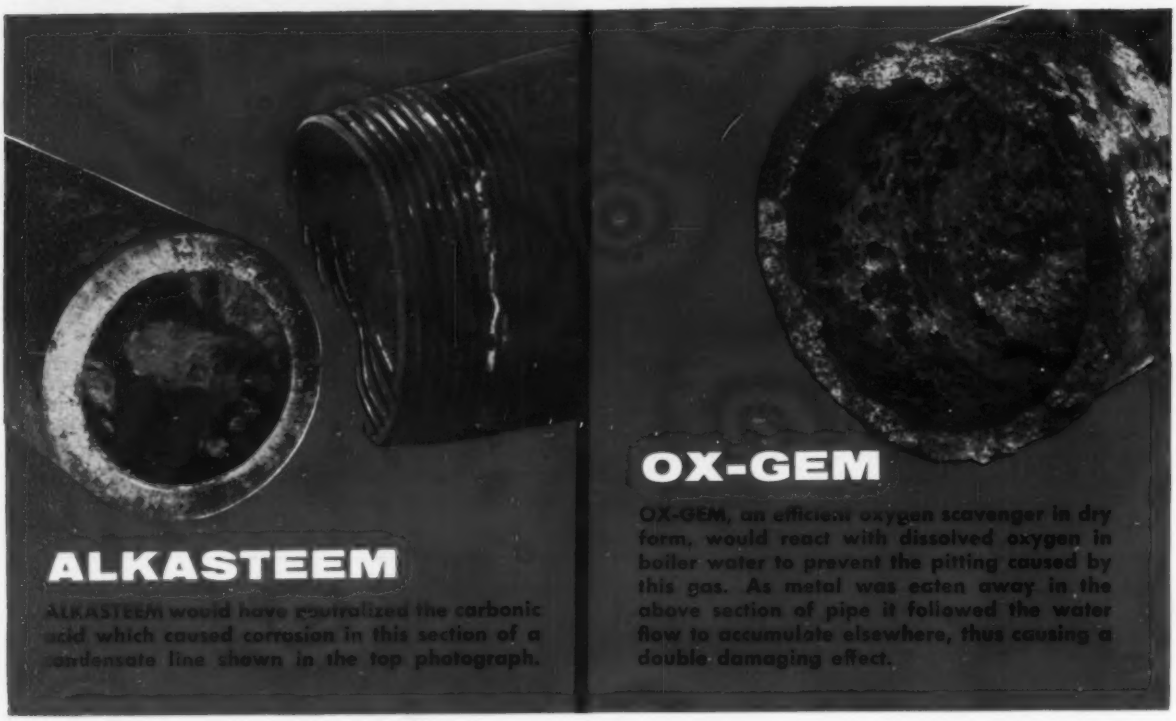
**JENKINS METAL SHOPS, Inc.**

P. O. BOX 1160

GASTONIA, NORTH CAROLINA

# ALKASTEEM & OX-GEM

## prevent corrosion in boilers and return lines



**ALKASTEEM**

ALKASTEEM would have neutralized the carbonic acid which caused corrosion in this section of a condensate line shown in the top photograph.

**OX-GEM**

OX-GEM, an efficient oxygen scavenger in dry form, would react with dissolved oxygen in boiler water to prevent the pitting caused by this gas. As metal was eaten away in the above section of pipe it followed the water flow to accumulate elsewhere, thus causing a double damaging effect.

## save expensive replacements

You can stop the corrosion in boilers, steam lines, steam traps, valves, unit heaters and return condensate lines. Corrosion is frequently caused by dissolved gases such as carbon dioxide and oxygen. When these gases occur in combination the rate of corrosion is greatly increased. If corrosion is allowed to go unchecked the result, of course, is costly shut-downs for repair and expensive replacements.

Throughout the South, hundreds of engineers rely on ALKASTEEM and OX-GEM and the counsel of Anderson's field service representatives to check these corrosive gases. The life of equipment is prolonged and the operating efficiency of your system is increased. The Anderson man is a good man to know.

**FREE SURVEY AND ANALYSIS SERVICE**

Anderson Service Representatives will be glad to discuss your particular water problems and make recommendations based on an analysis of the makeup water. There is an Anderson representative in your area who will gladly work with you. His services cost you nothing. They can save you much.

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Dallas 7, Texas: Box 10444, Industrial Station • Phone: Riverside 8-7080



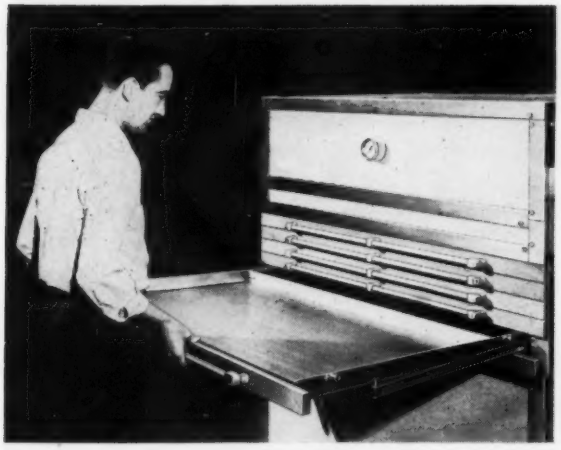
*For further information use Handy Return Card, Page 201*

30" in diameter may be used.

*Mayer Textile Machine Corp., 48 Industrial West, Clifton, N. J.*

Do you want more data? Write ◆ or use card on page 201; list L-112

## Dries 1,000 dozen ladies' hose in 8 hours



A new six-drawer tray type dryer for ladies' hosiery —the Paratray Dryer—is capable of processing 1,000 dozens per eight-hour day. Temperature is completely controlled, steam requirement is very low, all parts are readily accessible for cleaning and maintenance, and little floor space is required (3' 4" x 5' 4").

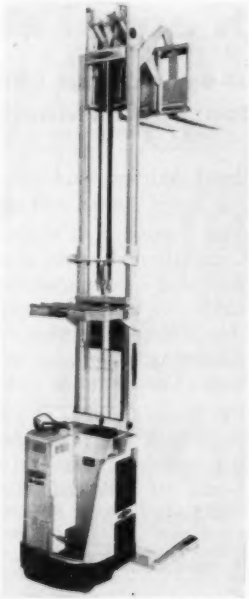
*Paramount Textile Machinery Co., 131 S. Wabash Ave., Chicago 3, Ill.*

Do you want more data? Write ◆ or use card on page 201; list L-113

## Electric truck speeds ceiling-high stacking

Specification changes in a new model narrow aisle electric "Reach Fork" truck result in improvements in performance, quality, and design of the product. A new high pressure hydraulic system allows smaller rams to be used and increases lifting speeds. Compact nested mast sections and a safety glass guard provide "picture window" visibility. The redesigned "Reach Fork" carriage is 12" lower to allow ceiling high stacking and 1-½" shorter for easier narrow aisle operation. The compact masts and carriage section reduce the dead weight of the elevating mechanism and improve battery performance.

*The Raymond Corp., Greene, N. Y.*



Do you want more data? Write ◆ or use card on page 201; list L-114

DRONSFIELDS' PATENT
ATLAS BRAND
EMERY FILLET

U.S.A. Patent 2426441

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THE PRINCIPAL MILL SUPPLY HOUSES AND CARD MAKERS

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new wood cellulose fabric *better than burlap for Roll Goods, All Items!*

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# Heavy duck or filmy scrim –range handles both with equal ease!

**Louis Allis Ajusto-Spede® Drives control speed and tension— cut set-up time—drive ranges on two floors individually or as one!**

Here's range-drive engineering that can revolutionize *your* cloth processing! This unique set-up for finishing bag cloth typifies the efficiency and flexibility that Louis Allis engineering and products provide for new mills — or for putting existing ones on a sound paying basis.

This remarkable range handles every type of cloth — from very heavy enameling duck down to filmy scrim — at speeds from 35 to 200 yards per minute. The Ajusto-Spede drives, like the 40-hp unit shown, furnish the right speed and tension for every step of the process.

Drives respond quickly, positively — change speeds softly and gradually. This precise control assures that every foot of cloth is uniformly wide — that it gets the exact amount of starch or filler — that it is properly dried, finished, and wound. The result: Faster processing, fewer breaks, and negligible waste.

The flexibility of operation is equally amazing. The installation consists of a two-motor range on the first floor and a three-motor range on the second floor. Each range can be run separately — or they can be combined into a single five-motor range with the flip of a switch. Changing from heavy to light cloth requires little set-up time. Commutation upkeep has been eliminated.

For modernizing — or a new installation — consult Louis Allis *first!* You'll get the best in products and engineering from a proven and respected source. Contact your Louis Allis District Office, or write The Louis Allis Co., 468 East Stewart Street, Milwaukee 1, Wisconsin.

**LOUIS ALLIS**

YS-113

MANUFACTURER OF ELECTRIC MOTORS AND ADJUSTABLE SPEED DRIVES



*For further information use Handy Return Card, Page 201*

## Abrasion- and chemical-resistant paint

A pigmented polyurethane coating or paint now available offers exceptional resistance to abrasion and chemicals, unusual flexibility, fast drying, and long wear. Called "Imron" urethane enamel, the new finish is available in several colors and applicable to wood, masonry, concrete, and metal.

The extremely high-gloss surface prevents accumulation of oil, lint, and other foreign matter and makes the finish easy to clean. Despite its slick appearance, however, the hard but elastic finish presents no slipping hazard. Applications foreseen are: heavily traveled floors and stairways of industrial plants, dry cargo bins and holds, and equipment exposed to chemicals that damage other paints.

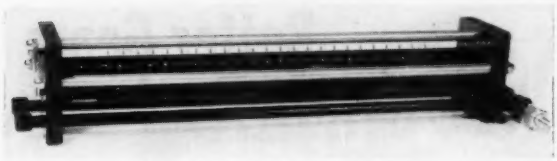
*Finishes Div., E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del.*

**Do you want more data? Write ◂ or use card on page 201; list L-115**

## Static neutralizing air stream furnished

A new "Air Bar" static eliminator supplies a static neutralizing stream up to three feet in depth. Furnished in lengths up to 120", the unit consists of air emission tubes coupled to an eliminator bar. The bar has two rows of emitting points and supplies a high concentration of ions through use of a "controlled diffused discharge" principle.

The air tubes are connected to the in-plant air supply or separate compressor and provide an air curtain that extends the neutralizing field in depth and width. Air volume is controlled by an air valve to accommodate the unit for any specific application. A number of bars can be operated from a single standard Takk power unit and in conjunction with other Takk static eliminator bars.



The Takk "Air Bar" static eliminator.

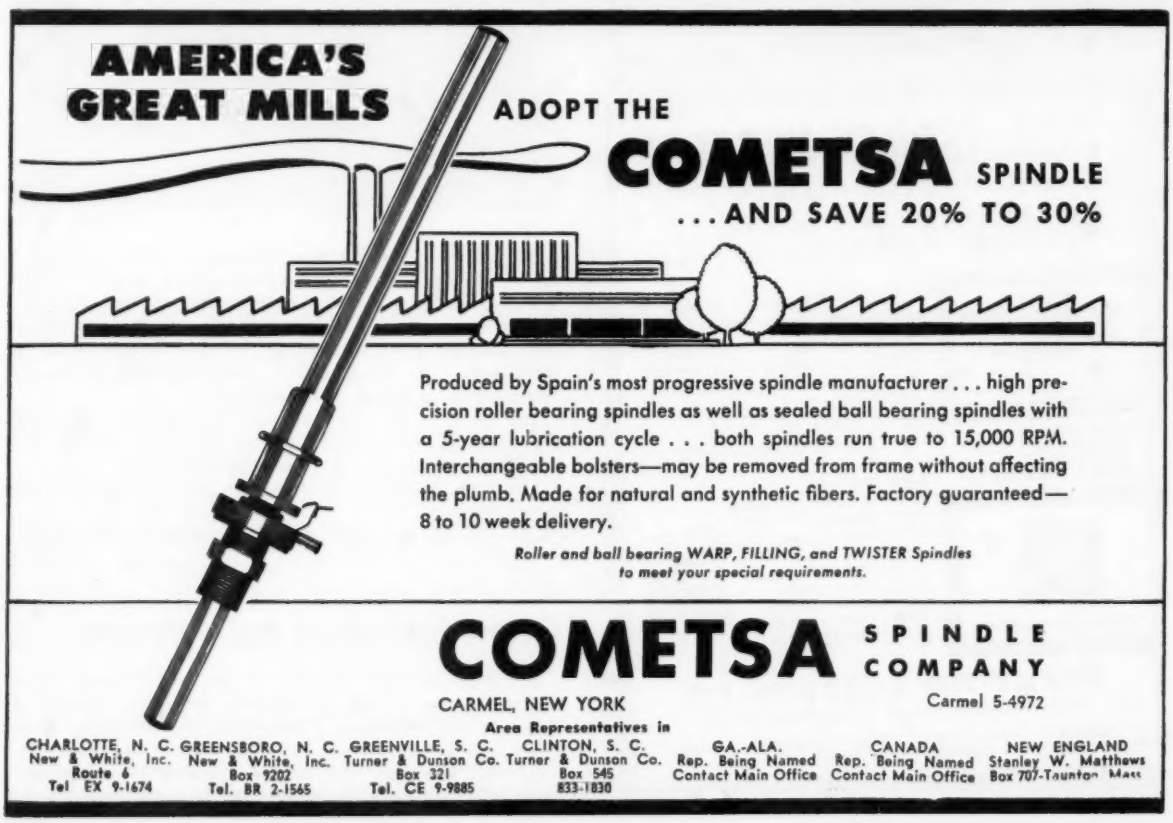
*The Takk Corp., Newark, Ohio.*

**Do you want more data? Write ◂ or use card on page 201; list L-116**

## Direct-reading stretch indicator for slashers

The WAK Stretch Indicator for slashers is an accurate, heavy-duty, quickly read instrument. Stretch is read directly on the 6⅜" x 12½" instrument panel in tenths of a per cent. Stretch between the delivery roll and one, two, or three size boxes can be quickly determined by simply setting a three-position selector switch on the panel.

Operation of the stretch indicator is simple. An input impulser, mounted at the size box, sends electric pulses to the instrument panel. An output impulser, mounted on the front roll, also sends pulses to the panel. When the input counter on the panel registers 1,000 counts, all pulses are automatically stopped and the stretch read in



AMERICA'S GREAT MILLS
ADOPT THE
COMETSA SPINDLE
...AND SAVE 20% TO 30%
Produced by Spain's most progressive spindle manufacturer . . . high precision roller bearing spindles as well as sealed ball bearing spindles with a 5-year lubrication cycle . . . both spindles run true to 15,000 RPM. Interchangeable bolsters—may be removed from frame without affecting the plumb. Made for natural and synthetic fibers. Factory guaranteed—8 to 10 week delivery.
Roller and ball bearing WARP, FILLING, and TWISTER Spindles to meet your special requirements.
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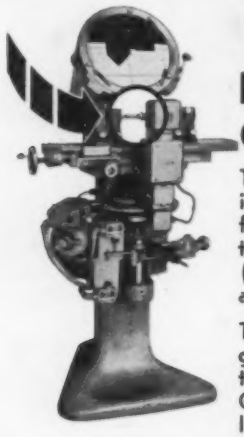

**Better Gears**
**by making mountains out of anthills**

This optical comparator is doing just that. The gear in the foreground is magnified 10 times on the calibrated screen (visible above) for intensely accurate inspection.

This is one of many details of gear manufacture and inspection that have given Ferguson Gears their reputation for high level performance.

For precision gearing, contact your nearest Ferguson Sales Engineer; or call or write the main office and factory, 511 Airline Avenue, Gastonia, North Carolina.

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WRITE FOR Bulletin 82 . . . spray nozzles, assemblies and parts for manual or automatic humidifying systems.

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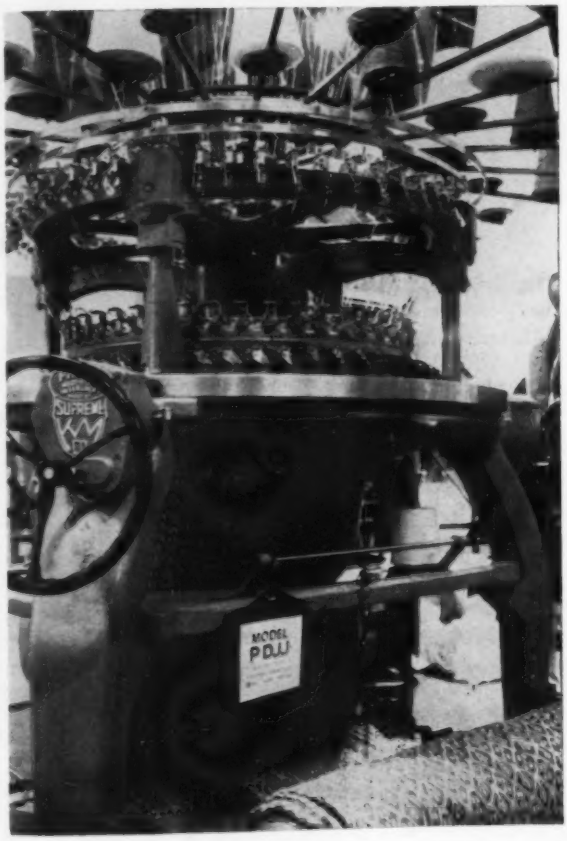
ADVANCED SPRAY NOZZLE DESIGN FOR NEW DIMENSIONS IN CONTROL AND PERFORMANCE


tenths of a per cent on the output counter. A reading of 1024 counts on the output counter indicates a stretch of 2.4 per cent.

*WAK Industries, P. O. Box 3095, Charlotte, N. C.*

**Do you want more data? Write or use card on page 201; list L-117**

## High-production Jacquard double jersey knitter




The Philip Model PDJJ circular knitting machine—a 33", 48-feed, Jacquard, double jersey knitter—offers very high production of a wide variety of non-spiral design patterns, including checks and plaids, ribs, single and double pique, and many others. Designs may be knitted in two, three, or four colors straight across the fabric without spiral or bias effect.

All cams of the machine are individually adjustable for knitting, welting, or tucking. Up to 18 needles per inch are available in the knitting elements.

*Jet Age Knitwear Machinery Corp., 6 Stanwix St., Brooklyn 6, N. Y.*

**Do you want more data? Write or use card on page 201; list L-118**

## Compact electric car has many in-plant uses

A 182-lb, 30" wide electric car specifically designed for industrial use is ideally adapted for plant executives, supervisors, laboratory personnel, maintenance men, plant guards, etc. Driven by a 12-volt electric motor, the Delwick three-wheel car can be operated for a full shift by the lead-acid battery which is then recharged in 12



*For further information use Handy Return Card, Page 201*

hours by plugging the charger into a 110-volt circuit.
*Namisco, Inc., 535 Morris Ave., Springfield, N. J.*
**Do you want more data? Write ◆ or use card on page 201; list L-119**

## Long-life card flat chain runs more smoothly

Improved smoothness and accuracy of operation, with less friction, are obtained with the new Ramsey cotton card flat chain on which link holes are shaved to remove the burrs and nicks that usually remain after normal punch press shearing and tearing. A more uniform sliver is produced with less waste, and the chain lasts longer than conventional chain as there is no grooving from burrs and nicks on link holes. Other advantages: no stiffness and "play" in the joints, allowing easier card flat attachment; a full bearing contact between bushings and links without friction; heavy cadmium plating.
*Ramsey Southeast Corp., 724 Gesco St., Charlotte 8, N. C.*
**Do you want more data? Write ◆ or use card on page 201; list L-120**

## High-production foam-to-fabric laminator

A recently introduced machine for bonding urethane foam to fabrics offers the following construction features: (1) continuous unwinding equipment to handle foam and fabric without stopping the unit for replacement of a roller; (2) a controlled adhesive roll which applies adhesive (solvent- or aqueous-based) to the foam; (3) a heat section composed of a minimum of eight rollers, each individually controlled, for the curing of adhesive; (4) electrically driven rotary knife edge trimmers to allow materials to be trimmed to any desired width; (5) a continuous rewinding system on which rolls of any size can be wound without stopping the machine. Designated the Liberty Laminator, the machine accommodates fabrics up to 60 inches wide.
*Liberty Machine Co., Inc., 275 Fourth Ave., Paterson 4, N. J.*
**Do you want more data? Write ◆ or use card on page 201; list L-121**

## Shows dynamic tension changes of moving yarns

A new Electronic Tension Recorder shows and records tension and its changes during spinning, twisting, and other yarn manufacturing and utilization processes. A

KLUTTZ
Lubri-Cased* Spinning Rings
BETTER 5 WAYS
1. Full speed break-ins
2. Higher spindle speeds
3. Longer traveler life
4. Higher quality yarns
5. Fewer ends down
OVER 3,000,000 now in service!
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Management and operating executives of textile manufacturing plants should make it a habit to read the Executive Section in each monthly issue of "Textile Industries." It contains

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RECENT TECHNICAL AND COMMERCIAL DEVELOPMENTS

★

EXECUTIVE VIEWS

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FUTURE EVENTS

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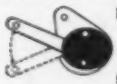
A powerful new "lap fighter." Unique shape allows closer flute positioning under front roll. Shorter, wider orifice concentrates air stream at point of maximum lint generation for remarkably good cleaning.

plus

DUFLEX 
Instant and effortless two-position suspension of flutes permits operator to work around rolls with both hands. Eliminates danger of scratched orifices which cause lint accumulation.

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NEW "LIGHTWEIGHT" PERALTA® MACHINE

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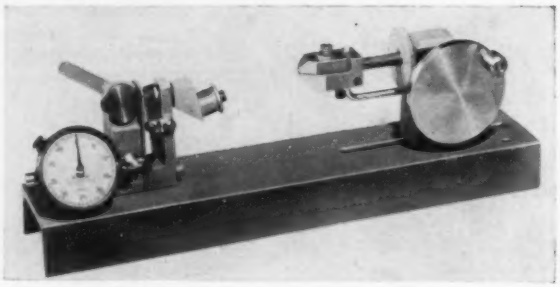
precision instrument in a convenient carrying case, it records quickly changing tensions; thus, steps can then be taken to engineer first and standardize tensions thereafter. With the instrument it is possible to make objective tension measurements during yarn spinning without breaking the roving. The effect of different tensioning devices, auxiliary oils, belt slippage, weight of traveler, speed of traverse, spindle speed, different rings, and other factors that influence tension from yarn ballooning to worn parts can be demonstrated objectively.

*Tensitron, Inc., P. O. Box 185, Harvard, Mass.*

Do you want more data? Write ◂ or use card on page 201; list L-122

## Tensile tester weighs only 6½ lb.

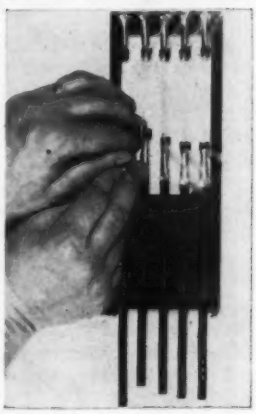


A portable tensile tester, designated Model VTA, is available in 50 and 100-lb load capacity versions. Designed for in-plant, field, and sales work, the machine provides accurate tensile strength data for rope, string, fishing line, and other textile materials. Over-all length of the tester is 15"; height, 6".

*Detroit Testing Machine Co., 9390 Grinnell Ave., Detroit 13, Mich.*

Do you want more data? Write ◂ or use card on page 201; list L-123

## Better way to make short-length shrinkage tests



With an instrument developed by Du Pont personnel it is possible to make precise shrinkage determinations on a small bundle of short-length fibers (specimen less than 3" in length and 8 milligrams in weight) of staple, tow, sliver, or spun yarns of Orlon acrylic fiber. Not only is a very good level of precision provided by the instrument, which is referred to as the Short-Length Shrinkage Determiner, but also an excellent correlation between the shrinkage of sliver of Orlon obtained from the Turbo Stapler and the shrinkage of yarns spun from this sliver. Other advantages are a reduction in time and manpower required for testing and a decrease in fiber waste due to testing.

Application of the instrument to other fibers is visualized.

*Bernie E. Layman Co., P. O. Box 146, Oreland, Pa.*

Do you want more data? Write ◂ or use card on page 201; list L-124

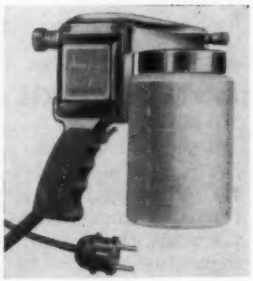
## Reed cleaning machine is efficient, versatile

Both pitch-bound and all-metal reeds can be brushed out and cleaned at the rate of 20 to 30 an hour with a reed cleaning machine now on the market. Reeds can be brushed with either steel bristle or hair bristle or both without changing wheels. Anyone can operate the compact machine which can be purchased already mounted on a tool cabinet or ready to mount on a work table.

*Greensboro Loom Reed Co., Inc., P. O. Box 1375, Greensboro, N. C.*

**Do you want more data? Write ◂ or use card on page 201; list L-125**

## Instantly cleans fabrics, leaves no rings



A Swiss-made, portable, electric chemical sprayer recently introduced in this country is used in textile mills for the following purposes: removal of grease, oil, tar, and many other stains; cleaning machinery; applying mothproofing and rustproofing compounds, etc. The 110-volt a-c, trigger activated unit, known as the Champion-Super Electric Compressorless Cleaning Gun, weighs only 3½ lb, provides 200 psi nozzle pressure and 130 psi operating pressure, and has one spray adjustment.

When used to clean fabrics, the gun provides instant cleaning without leaving rings, since the cleaning fluid is completely atomized and dirt is blasted through the fabric by the ultrasonic cleaning principle. A cleaning fluid, Formula 777 NU, is made especially for use with the gun and offers better solvency for a broader spectrum of soils, evaporates faster, has low toxicity, and is nonflammable.

*Jet-Stream Ltd., 74 Harrison Ave., Boston 11, Mass.*

**Do you want more data? Write ◂ or use card on page 201; list L-126**

## Compact machine cuts rolled goods wrapping cost

The new D-71 Dyken Speedwrap is designed to economically wrap rolled goods having consistent widths with a variation in diameter. Savings are realized by using less paper, buying paper in roll form instead of precut sheets, and by using glue instead of tape. Labor savings are effected by the individual operator being able to place, wrap, and remove the roll in approximately 15 seconds. Wrapping on the D-71 is completely automatic.

The roll is placed in wrap area, and the operator selects the paper requirement by a timer dial and activates unit. At this point the machine takes over, dispensing to correct length, applying glue, cutting off and completing the wrap without further effort on operator's part.

*Dyken Mfg. Co., 123 Jackson St., Oshkosh, Wis.*

**Do you want more data? Write ◂ or use card on page 201; list L-127**


The SECOND BEST way to spin wool-profitably

Whitin Wool Spinning Conversions

The best way to spin woolen yarn is common knowledge — the new Whitin FLEX-SPIN Spinning Frame.

But we're realistic. We know hundreds of Whitin Model E Wool Spinning Frames are now in operation. While still sound and sturdy, many are the victims of progress, being out-performed by today's technical improvements and unable to keep pace with today's high-speed operations.

Here's where a Whitin Conversion can work wonders — a real "booster shot" for lagging production.

Basically, three major improvements are involved:

- Traverses are increased from 11" to 16" by means of a reciprocating motion and the addition of balloon control rings. This results in the production of packages carrying 50% to 100% more yarn.
- New antifriction spindles and brakes are installed, permitting an increase in operating speeds up to 20%.
- Balancing cylinder drive is eliminated for improved cleanliness and lower maintenance.

FLEX-SPIN Wool Spinning Frame

While additional remedial steps may also be taken, (other Whitin accessories), these three usually put stragglers back into competitive operation at a cost so low it will amaze you. Don't be content with yesterday's performance for tomorrow's market — call your Whitin representative today.

WHITIN Machine Works • WHITINSVILLE • MASS.

CHARLOTTE, N.C. • GREENSBORO, N.C. • ATLANTA, GA. • SPARTANBURG, S.C. The best way to better yarns

## Bonds plastic films, synthetic fabrics

Savings in time, material, and labor are realized with a new device which utilizes ultrasonic energy for the sealing of plastic film and synthetic fabrics. Known as the Ultra Sonic Sealer, the equipment replaces conventional adhesive, high frequency, and heat sealing methods. Plastics which can be instantly and permanently bonded include Mylar polyester, polyethylene, polypropylene, nylon, and vinyl films, etc. Woven and nonwoven fabrics of nylon, Orlon, and Dacron may be bonded with the equipment, eliminating the necessity for sewing them together.

*Ultra Sonic Seal, Inc., div. of Kleer-Vu Industries, Inc., New York 16, N. Y.*

Do you want more data? Write or use card on page 201; list L-128

## Locates spinning frame's troublespots

Benefits to be derived by using the Adamsignal Portable Recorder, which records the minute-by-minute performance of each threadline delivery on a spinning frame, are as follows: (1) the deliveries on which the majority of end breaks occur are easily identified for repair; (2) the effectiveness of the operator can be determined; and (3) the selective maintenance principle may be utilized.

Variable reluctance pick-ups, housed in rail sections six to nine feet long, are temporarily clamped onto the ring rail so that each pick-up is close to the path of the traveler. If, for any reason, the traveler fails to pass by this pick-up head at a high rate of speed, the threadline is known to be broken. The running time and down time of each spindle are recorded on a bar chart in the control cabinet which is connected to the pick-up rails parked at frame end.

*Adams, Inc., 209 E. Stone Ave., Greenville, S. C.*

Do you want more data? Write or use card on page 201; list L-129

## Automatically checks color of moving cloth

Color control, color matching, and color sorting tasks can now be economically automated by a new technique for sorting products on the basis of their three color coordinates. Compared with visual inspection and manual operation, this system, which employs the Green-Bartlett high speed colorimeter, is faster, more accurate, and less costly. Among textile mill applications visualized for the color measurement and sorting equipment, which is engineered to specific production requirements, are: (1) a

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COTTONS
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*Woolen and Worsted Mills*
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INDUSTRIAL ENGINEERS
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SPECIALIZING IN TEXTILES SINCE 1914
Ralph E. Loper Co.



For further information use Handy Return Card, Page 201

quill shader which sorts quills into eight different color categories at a rate of two per second; (2) monitoring the color uniformity of moving cloth.

Improvement in quality and reduction in production costs are benefits to be derived from this equipment. Others: eliminates human error due to variations in color perception, operator fatigue, and sample illumination; reduces need for trained operators and inspectors; provides color resolution better than that possible for the human eye.

The colorimeter combines an electronic optical head with a small scale digital computer. Light reflected from a colored material to a photodetector generates a series of signals which represent the tristimulus values. These signals are fed to a computer where coded color information is converted to digital form and stored for subsequent actuation of sorting mechanisms or process controls.

*Allied Research Associates, Inc., Colorimetry Div., 43 Leon St., Boston 15, Mass.*

**Do you want more data? Write ◂ or use card on page 201; list L-130**

## Makes 130 lb double knit jersey in 8 hours

The new Terrot Model IZ Special Double Knit Jersey Machine — a 30" diameter, 36-feed, 14 - 18 cut circular knitter — is capable of producing more than 130 lb of cloth per eight-hour shift. In addition to double knits, interlock fabric, single piqué, 8-lock textures, ripple stitches, and small fancy tuck designs may be produced on the machine which offers the following construction features: positively controlled feedwheel system; controlled dial and cylinder clearing cams; infinitely variable speed drive; lint removing device; two types of needles in cylinder and dial.

*Speizman Knitting Machine Corp., 508 W. 5th St., Charlotte 1, N. C.*

**Do you want more data? Write ◂ or use card on page 201; list L-131**

## Cuts operating cost of vacuum slot extractors

A steam jet air ejector and condenser system to handle the suction requirements of vacuum slot extractors used for predrying in textile wet processing plants has been developed. The ejector has sufficient air handling capacity to maintain 10" to 15" of mercury, depending on the construction of the cloth. Among advantages of ejectors for vacuum production are: cheapest source of power is used — the steam already generated; no moving parts are involved; low initial, installation, and maintenance costs; water heating as a by-product of vacuum production; extreme flexibility in installation arrangement.

*Condenser Service & Engineering Co., Inc., Hoboken, N. J.*

**Do you want more data? Write ◂ or use card on page 201; list L-132**

**Singeing**
**Nylon Setting**
**Preheating**
**Tenter Frame Drying**
**Setting Pigment Dyes–Resins**

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Improved Red-Ray Gas Burners deliver efficient, economical heat, where you want it, when you want it. More than 20 years experience in the heat processing of textiles. Write or phone us for more information.

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- MILL CIRCULATION
- EDITORIAL PAGES
- ADVERTISING PAGES

*(Use Postage Paid Card—Page 201)*

# FREE BOOKLETS

**10-1 HOOKER CHEMICALS**—Bulletin lists and describes 108 organic chemicals for industry in the form of a quick reference digest. Hooker Chemical Corporation, Niagara Falls, New York.

**10-2 LOOM PART REPLACEMENTS**—Booklet can be individually assembled for replacement requirements on the following looms: E, K, P, Modified D, X, X2, L, O, XL, XD, XK, and XP. Catalog Department, H. F. Livermore Corporation, Allston Station, Boston 34, Massachusetts.

**10-3 TWITCHELL LUBRICANTS** — Booklet lists performance data and recommended applications for Twitchell lubricants for woolens, worsteds, and blends with synthetics. Bulletin No. 414A, Emery Industries, Inc., Department 5, Carew Tower, Cincinnati 2, Ohio.

**10-4 HFS STARCH**—Booklet lists physical characteristics, properties, film strength, water absorption, etc., of HFS starch. National Starch & Chemical Corporation, 750 Third Avenue, New York 17, New York.

**10-5 COMPACT HEAT EXCHANGERS**—Bulletin provides complete information on a line of stock model compact heat exchangers. Basco, Inc., 345 Payne Street, North Tonawanda, New York.

**10-6 PUMP SELECTION** — Complete expanded pump line is described in 1,008-page "Pic-A-Pump" catalog. Write on company letterhead to Allis-Chalmers Manufacturing Company, Milwaukee 1, Wisconsin.

**10-7 SLACK SELVAGE ELIMINATOR** — Bulletin describes slack selvage eliminator expanders designed to spread cloth widthwise, eliminate creases, wrinkles, and bagginess. Mount Hope Machinery Company, 15 Fifth Street, Taunton, Massachusetts.

**10-8 ELECTRICAL AND LUBRICATING DEVICES** — Condensed catalog covers complete line of electrical and lubricating devices, including specifications, operating descriptions, etc. Trico Fuse Manufacturing Company, North Fifth at West Chambers, Milwaukee 12, Wisconsin.

**10-9 BULK HANDLING OF STARCH**—Report tells how Springs Cotton Mills supplies starch to seven separately located mills by a bulk delivery. Request Fuller Fact File ER-2046-2, Fuller Company, Catasauqua, Pennsylvania.

**10-10 HYPALOX THREADGUIDES** — Brochure gives physical properties and surface properties of sintered aluminum oxide guides. American Feldmuehle Corporation, 11 West 42nd Street, New York 36, New York.

**10-11 LEVELING AGENTS**—Manual describes the most effective use of leveling agents in vat dyeing. Sou-Tex Chemical Company, Mount Holly, North Carolina.

**10-12 SELVEDGE HOLE DETECTOR**—Bulletin tells how to avoid knitting holes, and thereby save money and increase production with new selvedge hole detector. Crawford Manufacturing Company, 62 Water Street, New Brunswick, New Jersey.

**10-13 DIGITAL PROCESS CONTROLLERS**—Booklet describes digital process controllers for industrial counting, measuring, indicating and control applications. Louis Allis Company, Department P, 427 East Stewart Street, Milwaukee 1, Wisconsin.

**10-14 DRY FLUID DRIVES**—Booklet describes simplified method for selecting Flexidyne dry fluid drives and couplings for most industrial applications. Bulletin No. 70, Dodge Manufacturing Corporation, Mishawaka, Indiana.

**10-15 COMPACT CARDING MACHINES**—Brochure describes compact carding machine, an efficient multipurpose unit with application in a variety of requirements. Davis & Furber Machine Company, North Andover, Massachusetts.

**10-16 TWO NEEDLE MACHINES**—Bulletin tells how two needle machines provide double stitching protection, and includes data on typical uses. Merrow Machine Company, 28 Laurel Street, Hartford, Conn.

**10-17 STRAPPING PROBLEM SOLVED**—Case history tells how a New York textile converting firm used an F1 strapping machine to solve a costly overtime problem. Acme Steel Company, 135th St. & Perry Avenue, Chicago 27, Illinois.

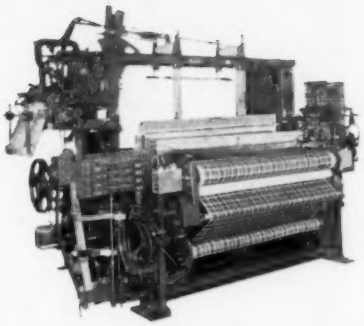
**10-18 HYDROLYZED POLYVINYL ALCOHOLS**—Bulletin highlights a super hydrolyzed polyvinyl alcohol available in commercial quantities. Resin and film properties described in detail. Air Reduction Chemical & Carbide Company, 150 East 42nd Street, New York 17, New York.

**10-19 INDUSTRIAL HEAT TRANSFER**—Brochure describes "Panelcoil", a heat transfer surface for economical, convenient industrial uses. Dean Products, Inc., 1042 Dean Street, Brooklyn 38, New York.

**10-20 ELECTRONIC BOBBIN TESTER**—Bulletin tells how electronic bobbin tester eliminates bobbins with objectionable degree of runout or crookedness and avoids misalignment problems in the shuttle. Steel Heddle Manufacturing Company, Philadelphia 32, Pa.

**10-21 TEXTILE SOFTENERS**—Technical bulletin describes two new softeners, as well as the original member of the "Emersoft" line. Performance evaluations, application and formulations included. Emery Industries, Inc., Department 5, Carew Tower, Cincinnati 2, Ohio.

**10-22 AIR PUMPS**—Descriptive price list gives latest prices on complete line of rotary vacuum pumps, pressure pumps, gas boosters, and accessories. Leiman Bros, Inc., 102 Christie Street, Newark 5, New Jersey.



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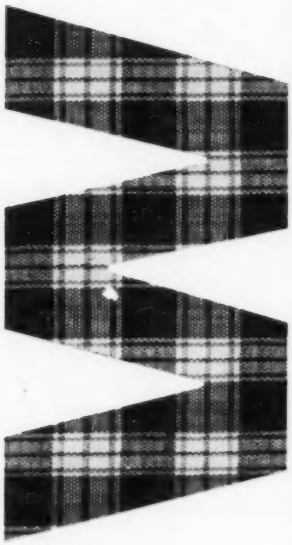
QUALITY OF CLOTH · SPEED OF LOOM
EFFICIENCY · WEAVER ACCEPTANCE
MAINTENANCE COSTS · TRAINING TIME



**WEAVER ACCEPTANCE** of the C-7 Loom is as automatic as the loom itself because less effort is required to operate it and there are fewer duties to perform. Electric controls make many operations automatic and eliminate others, particularly the heavy manual work. Weavers not only say that weaving is easier with the C-7 than with other less automatic looms, but with a minimum of training they can weave quality cloth while operating looms at capacity.

**WORK ASSIGNMENTS** may reflect the better working conditions provided by C&K's push-button loom. Less fatigue dramatically reduces human errors and increases weavers' work capacity. Satisfied personnel stabilize employment, and less turnover lowers costs in many ways. Protection devices permit higher speeds with safety. Fixers make repairs more easily, shortening stop intervals and allowing them to keep more looms operating. The C-7's ease of operation helps mills find and keep more women weavers.

Weave room personnel, management and mill owners all gain from savings on production costs. More specific technical information is contained in our bulletin "Gain the Competitive Edge." Write us for a copy.

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# BOOKLETS

*raw stock to roving*

**T-101** **LUMMUS PEPPER - SHAKER OPENER.** Gives complete details and photographs. Aldrich Machine Works, P. O. Box 760, Atlanta, Ga.

**T-102** **STATIC ELIMINATION.** How to eliminate static safely and inexpensively. Simco Co., 920 Walnut St., Lansdale, Pa.

**T-105** **VERSA - MATIC DRAWING FRAME.** Describes drafting elements, quality of sliver, roving and yarn possible. Saco-Lowell Shops, Textile Machinery Div., Easley, S. C.

**T-106** **SARGENT OPENER.** Describes opener with rotary evener and stripper. C. G. Sargent's Sons Corp., Graniteville, Mass.

**T-107** **FEATHERTOUCH DRAFTING.** How to get "highest production per frame at lowest cost." Ideal Industries, Inc., Bessemer City, N. C.

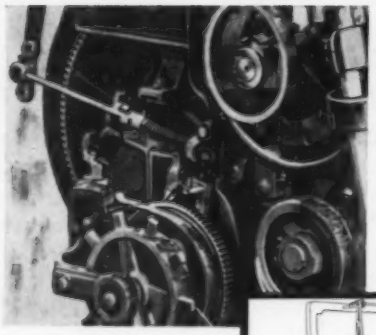
**T-112** **ADVANTAGES OF ALDRICH PICKERS.** Good technical text, comprehensive pictures. Aldrich Machine Works, P. O. Box 750, Atlanta, Ga.

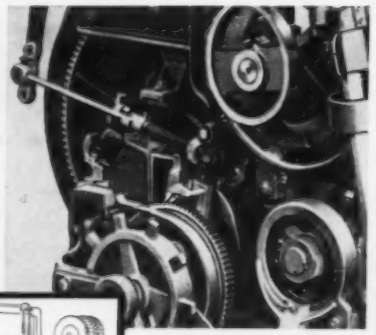
**T-113** **NEW CONDENSER TAPE.** Describes Supr-O-Tape, an impregnated fabric condenser tape. Benjamin Booth Co., Allegheny Ave. & Janney St., Philadelphia 34, Pa.


**NON-FLUID OIL**

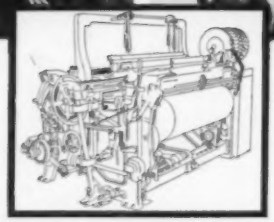
TRADE MARK REGISTERED

**A grade available for any type loom**





**Ordinary Oils and Greases Get on Warps and Fabric**



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NON-FLUID OIL stays in bearings lubricating dependably until entirely consumed. Unlike ordinary oils or greases it does not drip or spatter on warps, fabric and the floor. With NON-FLUID OIL you achieve highest output of perfect cloth and maximum efficiency. And, because NON-FLUID OIL outlasts ordinary lubricants by three to five times, you save on both lubricant and application cost.

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*NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture. So-called grease imitations of NON-FLUID OIL often prove dangerous and costly to use.*


**T-119** **FIBER METER.** Automatic weighing and blending assures quality, holds variation to 1%. James Hunter, Inc., P. O. Box 298, Mauldin, S. C.

**T-120** **PIN DRAFTERS.** Textile job report No. 21 tells how Warner & Swasey Pin Drafters help modify jute systems for carpet yarns. Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.

**T-121** **UNIVERSAL CARD COILER.** Literature describes both head and base swivel for adjustment. Includes data on 90-day free trial. McDonough Power Equipment, Inc., McDonough, Ga.

**T-122** **RECONDITION OPENING & CLEANING.** Bulletin gives whys and wherefores of reconditioning your opening and cleaning lines. Special attention given to each machine with suggestions as to parts replacement. Saco-Lowell Shops, Replacement Parts Div., Box 327, Greenville, S. C.

**T-123** **COILER CONVERSIONS.** Full facts on low initial cost conversion to larger coiler cans. Lists advantages, has complete description. Southern States Equipment Corp., Hampton, Ga.

**T-124** **CARD DRIVE.** Bulletin 301-a describes simple, safe, efficient individual card drive. Southern States Equipment Corp., Hampton, Ga.

**T-132** **PROCTOR SUPER PICKER.** Data sheet gives details of the Proctor Super Picker for use on slabs of baled cotton, or wool and synthetic blends in layers up to 12" thick. Proctor & Schwartz, Inc., 7th St. and Tabor Rd., Philadelphia 20, Pa.

*yarn and warp making*

**T-201** **PRODUCTS FOR SPINNING AND WEAVING.** Complete line, applications, advantages shown. Dayco Corp., Textile Div., Dayton, Ohio.

**T-202** **NEW BOBBIN MANUAL.** Complete bobbin guide. Lestershire Spool Division, National Vulcanized Fibre Co., Wilmington 99, Delaware.

**T-203** **SPINDLE OIL.** "Gulfspin" insures against excessive wear and eliminates spindle wobble. Gulf Oil Corp., Gulf Bldg., Houston, Texas.

**T-205** **HIGH SPEED AUTOMATIC QUILLER.** Lists advantages and dimensions of "Autocopser." Terrell Machine Co., Inc., P. O. Box 928, Charlotte, N. C.

**T-208** **PACKAGED SPINNER MODERNIZATION.** Details on Collecto-Vac, Open-Aire Creels, Cross-Jet Cleaner. Air Conditioning Bahnson Company, Winston-Salem, N. C.

**T-209** **SECTIONAL WARPER.** Describes full width and sectional warpers for knitting, weaving. Robert Reiner, Inc., Weehawken, New Jersey.

**T-210** **CONICAL RINGS AND FLYERS.** Complete details and specifications. Herr Manufacturing Co., Inc., 318 Franklin St., Buffalo 2, New York.

**T-211** **PRECISE WINDING MACHINE.** For winding pineapple or straight cones and tubes of synthetics. Foster Machine Co., Westfield, Mass.

**T-212** **AUTOMATIC CLEANING EQUIPMENT.** Working details and advantages of the Tri-Rail Cleaner. American MonoRail Co., 111 East 200th St., Cleveland 17, Ohio.

**T-216** **SPINNING FRAME CONVERSIONS.** Big-package, new frame results at half the cost. Meadows Mfg. Co., P. O. Box 10876, Station A, Atlanta, Ga.

**T-217** **COLLECTO-VAC.** New development collects line, fly and broken ends. The Bahnson Company, Winston-Salem, N. C.

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## BOOKLETS

**T-227** **SPINDLE OILING MACHINE.** Features and advantages noted. Wicaco Machine Corp., 4800 Stenton Ave., Wayne Junction, Philadelphia 44, Pa.

**T-228** **HANDY SPINNING REFERENCE.** Shows traveler speeds, sizes of ring flanges. Saco-Lowell Shops, Parts Replacement Division, P. O. Box 327, Greenville, South Carolina.

**T-229** **UNIRAIL UPTWISTER.** Higher yarn quality and better packages at faster speeds. Leesona Corp., P. O. Box 1605, Providence, R. I.

**T-230** **PRECISION TEXTILE WINDING.** Tensions and density control for winding rubber cones. Kidde Textile Machinery Corp., Farrand St., Bloomfield, N. J.

**T-231** **CONE WINDER.** Describes Model 102 winder, including applications. Foster Machine Co., Westfield.

**T-232** **SHORT CUT TO STAPLE FIBER SPINNING.** Ten steps in operation of the Tow Stapler. Turbo Machine Co., Lansdale, Pa.

**T-233** **WEAVER'S KNOTTER.** Instructions as to use, description. A B. Carter, Inc., Gastonia, N. C.

**T-234** **TEXTILE ROLL COVERINGS.** Describes complete line as well as other mill supplies. Armstrong Cork Co., Industrial Div., Lancaster, Pa.


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**T-239** **LARGE PACKAGE TWISTER.** Information on new anti-friction Jumbo Twister which carries a 14" bobbin with a 12" build. Meadows Mfg. Co., P. O. Box 10676, Sta. A. Atlanta, Ga.

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**T-242** **RING SPINNING FRAME.** Folder presents description, illustrations and specifications of up-to-date Simplex ring spinning frames. Davis & Furber Machine Co., North Andover, Mass.

**T-243** **ANTI-FRICTION TWISTER BEARINGS.** Find out how bearings helped make The Meadows Twister almost friction-free. Fafnir Bearing Company, New Britian, Conn.

**T-246** **BETTER BEAMS.** Information on three ways to make better beams. Kidde Textile Machinery Corp., Farrand St., Bloomfield, N. J.

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### *slashing—weaving—tufting*

**T-301** **COUNTING AND MEASURING DEVICES.** Wide range of counting devices for all types of textile machinery. Veeder-Root, Inc., Hartford, Conn.

**T-302** **LOOM SUPPLIES.** Describes complete line. E. H. Jacobs Mfg. Co., P. O. Box 3096, Charlotte, N. C.

**T-304** **LOOM PRODUCTION CHARTS.** Celluloid card shows yards per loom per week. Ralph E. Loper Co., Greenville, S. C.

**T-306** **THE STORY OF STARCHES.** History and information on manufacture and use of starches National starch & Chemical Corp., 750 Third Ave., New York 17, N. Y.

**T-309** **PENFORD GUMS IN TEXTILES.** Describes their excellent properties for warp sizing spun yarns. Penick & Ford Ltd., Inc., 750 Third Ave., New York 17, New York.

**T-314** **LOOM REED BOOKLET.** Describes in detail a variety of reeds. Steel Heddle Mfg. Co., 2100 West Allegheny Ave., Philadelphia 32, Pa.

**T-315** **COCKER EQUIPMENT.** Information on warp sizer, beam warper, creels, tensions, back-winders, etc. Cocker Machine & Foundry Co., Gastonia, N. C.

**T-318** **FORMULAS FOR SLASHING ARNEL.** Includes also information on warping, weaving and quilling. Textile Sales Dept., Celanese Corp. of America, P. O. Box 1414, Charlotte 1, N. C.

**T-319** **ECLIPSE STARCHES FOR TEXTILES.** Data sheet describes use of thin-boiling starches in the textile industry, with particular emphasis on warp sizing. Physical and chemical data included. A. E. Staley Mfg. Co., Decatur, Ill.

**T-321** **COCKER SLASHERS.** Complete specifications and advantages, including allied equipment. Cocker Machine & Foundry Co., Gastonia, N. C.

**T-322** **MOUNTS FOR LOOMS.** Vinyl mount eliminates need for bolts or paste. Clark, Cutler, McDermott Co., 106 W. Central St., Franklin, Mass.

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**T-324** **ALIGNING LAYS.** Setting instructions for step-by-step aligning. Draper Corporation, Hopedale, Mass.

**T-325** **TRAVELING LOOM CLEANER.** Advantages of the new Oscillaire loom cleaner. Parks-Cramer Co., Fitchburg, Mass.

**T-326** **DRAPER REPAIR PARTS CATALOG.** Contains illustrations covering all mechanisms and construction with complete listings. Draper Corporation, Hopedale, Mass.

**T-328** **TEXTILE MACHINERY PARTS CATALOG.** Describes complete line of Dayco and Thorobred textile parts. Dayco Corp., Dayton, Ohio.

**T-329** **COUNTING DEVICES.** Describes complete line of counters for every application. Trumeter Company, 38 W. 32nd St., New York 1, New York.

**T-331** **STATIC BARS.** Humorously illustrates how static can be overcome. The Simco Co., 920 Walnut St., Lansdale, Pa.

**T-332** **CARE OF DRAPER SHUTTLES.** Describes how longer, trouble-free service may be obtained. Draper Corporation, Hopedale, Mass.

**T-346** **FACTS ON NONWOVENS.** Fact file on non-wovens tells of new machinery, new methods of handling fibers, new bonding agents, etc. Curlator Corporation, Textile Division, East Rochester, N. Y.

**T-347** **New DRYING SYSTEM.** Describes high capacity, custom engineered drying equipment for tufted plants. Dalton Sheet Metal Co., Inc., Dalton, Ga.

**T-351** **AUTOMATIC STOP MOTION.** Complete information available on automatic stop motion for Titan warp tying-in machine. Edda International Corp., 468 Fourth Ave., New York 16, N. Y.

**T-353** **BACKING FOR TUFTEDS.** How to get your tufting necessities with one telephone call. Fulton Cotton Mills, P. O. Box 1726, Atlanta 1, Ga.

**T-355** **NON-WOVEN FABRICS.** Booklet gives outline of nature and history of non-woven and the manufacturing techniques of today. Booklet 56-219A. Chemical Div., Goodyear Tire & Rubber Co., Akron 16, Ohio.

**T-358** **LOOM SUPPLIES.** Information on rod lubricant and applicator, sponge leather bunter, picker. Garland Mfg. Co., 54 Water St., Saco, Me.

**T-362** **SIZE THAT SATISFIES.** Information on getting the correct size package for your mill. Also on Bingham line of slasher rolls. Stodghill & Co., 716 Ponce de Leon Place, Atlanta, Georgia.

**T-363** **RUBBER COVERED SLASHER ROLLS.** Handy booklet tells how to get longer life and better performance from rubber covered rolls. Includes data on handling storing and grinding. Stowe-Woodward, Inc., Dept C., 181 Oak St., Newton Upper Falls 64, Mass.

**T-364** **CONTINUOUS STARCH COOKER.** Booklet shows how the use of continuous cookers for starch assures accurate control, economy, low maintenance in warp sizing and finishing. Clinton Corn Processing Company, Clinton, Iowa.

### *knitting*

**T-403** **RASCHEL KNITTER.** Describes new Raschel-type knitting machine. Kidde Textile Machinery Corp., Inc., Farrand St., Bloomfield, N. J.



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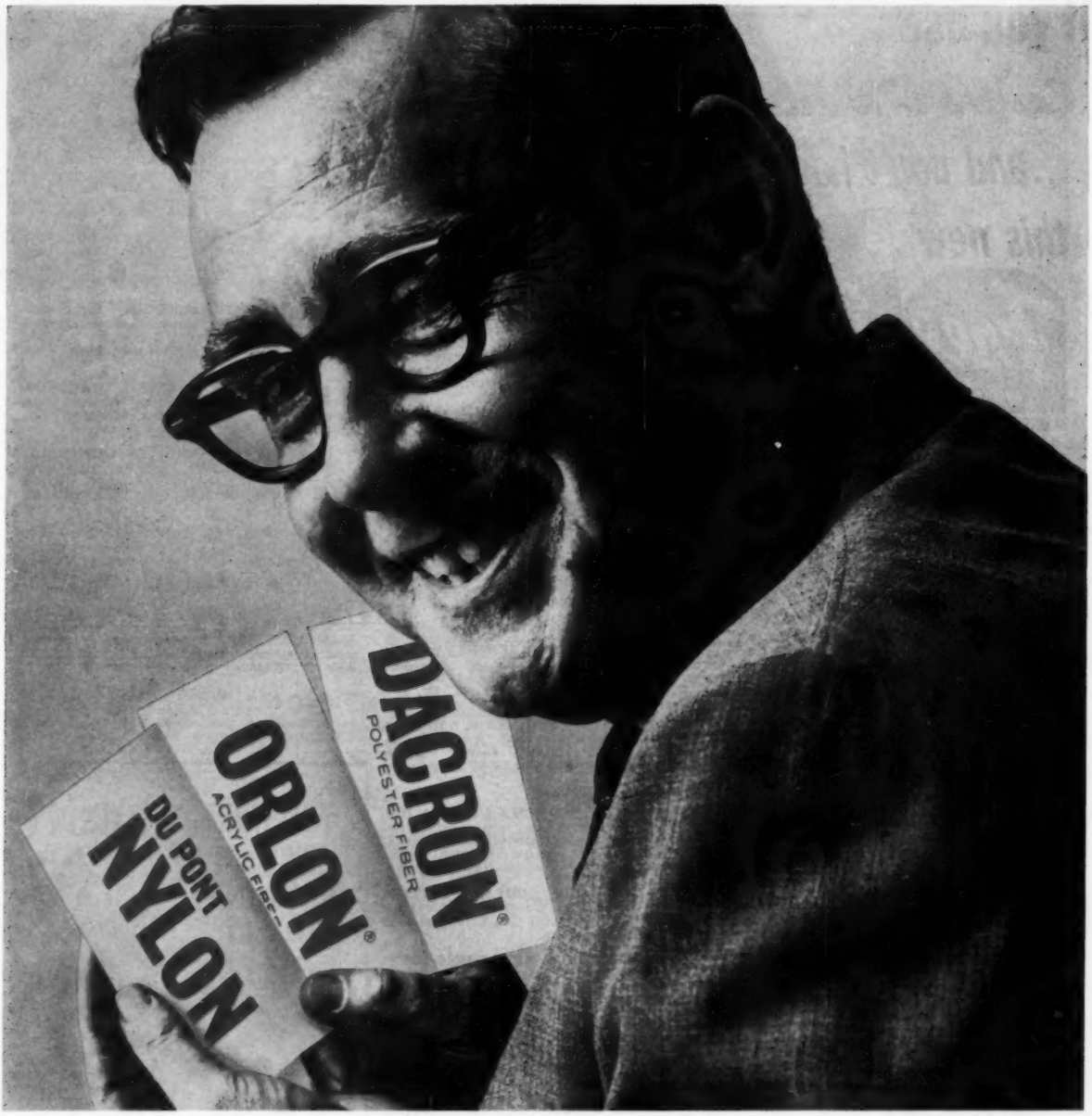


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## BOOKLETS

T-406 **NEEDLE OIL DOES NOT STAIN.** Details on "Gulftex 39" developed for knitting mills. Gulf Oil Corp., Gulf Bldg., Houston, Texas.

T-407 **KNITTING MACHINES.** Information on Wildman "TFS" 30" single section F-F machines and "AL" 30" diameter 32-feed "single purpose" circular interlock machine (rib type) Wildman-Jacquard Div., Draper Corp., Hopedale, Mass.

T-410 **"READING" TYPE 60 F-F KNITTING MACHINE.** Information about the new "Reading" Type 60, 38-section automatic full-fashioned hosiery knitting machine. Write Textile Machine Works, Reading, Pa.

### *wet processing*

T-500 **WEBB GUIDE SYSTEMS.** Folio No. EG-84 describes webb guide systems for cloth applications. G.P.E. CONTROLS, INC., 240 E. Ontario St., Chicago 11, Ill.

T-502 **FINISHING MACHINERY.** Text and photographs of complete line of machinery. Marshall and Williams Corp., 46 Baker St., Providence, R. I.

T-503 **WATER ANALYSIS.** Includes tables, conversion factors, indicators, standard solutions. Solvay Process Div. Allied Chemical Corp., 61 Broadway, New York 6, N. Y.

T-504 **UREA FORMALDEHYDE.** Literature on urea formaldehyde or U.F. concentrate-85. Dept. CUFI-29-1. Nitrogen Div., Allied Chemical Corp., 40 Rector St., New York 6, New York.

T-506 **CATIONIC SURFACE ACTIVE AGENT.** Describes Uversoft "D." Harshaw Chemical Co., 1945 East 97th St., Cleveland 6, Ohio.

T-508 **PEROXIDE BLEACHING SYSTEM.** Illustrates and describes this continuous system. E. I. du Pont de Nemours & Co., Electrochemical Dept., Wilmington, Del.

T-510 **TEXTILE CHEMICALS.** Describes leading products for wet processors. Royce Chemical Co., Carlton Hill, N. J.

T-512 **DEPUMA.** Decribes odorless, viscous, non-evaporating emulsion for anti-foam. Koppers Co., Inc., Chemicals & Dyestuffs Div., Porter Bldg., Pittsburgh 19 Pa.

T-513 **CATALYST AC-6.** Tells how curing efficiency may be stepped up as much as 25%. Monsanto Chemical Co., Plastic Division, Springfield 2, Mass.

T-514 **SODA ASH BULLETIN.** Contains useful data covering this subject. Solvay Sales Division Allied Chemical Corp., 40 Rector St., New York 6, New York.

T-516 **ALUMINUM CHELATE PEA-1.** Technical data sheet tells how aluminum Chelate PEA-1 may be used with advantage in many applications where aluminum in proplate is unsatisfactory. Harshaw Chemical Co., 1945 East 97th St., Cleveland 6, Ohio.

T-517 **CHEMICAL CATALOG.** Lists products with chemical composition, properties and applications. Antara Chemicals Div., General Aniline & Film Corp., 435 Hudson St., New York 14, New York.

T-519 **HYDRAULIC POWER UNITS.** Describes unit for operating hydraulic textile machines. B. F. Perkins & Son, Inc., Holyoke, Mass.

T-522 **CUT WATER TREATMENT COSTS.** Describes the control of scale, slime, algae and corrosion. Oakite Products, Inc., 126C Rector St., New York 6, New York.

T-526 **PRODUCTS FOR TEXTILE IMPROVEMENT.** Describes products and services designed to provide better fabrics. B. F. Goodrich Chemical Co., 3135 Euclid Ave., Cleveland 15, Ohio.

T-527 **SODIUM HYDROSULFITE.** Literature and test samples are available on "T-C Hydro." Tennessee Corp., 617-629 Grant Bldg., Atlanta, Ga.

T-528 **ETHANOLAMINES.** Lists application, chemical and physical properties. Nitrogen Division, Allied Chemical Corp., 40 Rector St., New York 6, New York.

T-531 **ROTARY DYEING MACHINE.** For use in dyeing hosiery, hats, gloves, socks, etc. Turbo Machine Co., Lansdale, Pa.

T-534 **DYEING AND FINISHING MACHINERY.** Complete line presented in series of catalogs. Birch Brothers, Inc., 32 Kent St., Somerville 43, Mass.

T-535 **DYEING, BLEACHING AND DRYING EQUIPMENT.** Complete line for cotton, wool and synthetics described. Color pictures. Morton Machine Works, 1715 3rd Ave., Columbus, Ga.

T-536 **NAPHTHOL RATIOS SLIDE CHART.** Quickly and accurately enables operators to determine Naphthol Ratios. Alliance Color & Chemical Co., 33 Ave. P, Newark 5, New Jersey.

T-540 **PENFORD FINISHING GUMS.** Complete data, including physical properties. Penick & Ford Ltd., Inc., 750 Third Ave., New York 17, New York.


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# What you should know about STARCH*

## *YOU PROBABLY KNOW—BUT OTHERS MAY NOT*

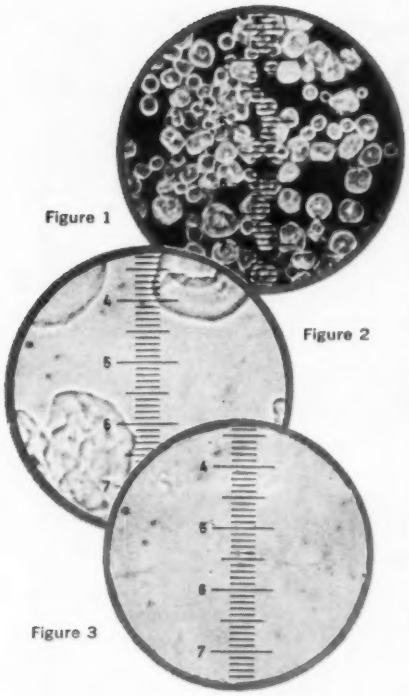

Figure 1

Figure 2

Figure 3

All photomicrographs taken at 382.5X Magnification

## What is "Cooked" Starch?

Starch in a size formulation is present for its film-forming properties. Maximum use of this property depends upon completely gelatinizing the starch—cooking it. Completely gelatinized starch is prepared from granular starch which is in slurry, as in Figure 1. It is then heated sufficiently so that the granules pass through a stage of swelling, as in Figure 2. Finally, and most important, the cook reaches the stage where these swollen granules disrupt and form a homogeneous dispersion, as in Figure 3. At this point, the starch has reached its optimum physical condition for formation of continuous, flexible, strong films.

These photomicrographs, taken under conditions of phase microscopy in the new Hubinger microscopy lab, illustrate very graphically why an incompletely "cooked" starch is not capable of forming a completely continuous film. The presence of large amounts of the swollen sacs throughout the film can easily be seen to weaken the film and result in shedding and poor weavability.

Thoroughness of gelatinization is affected strongly by such variables as cooking time and temperature, types and amounts of softeners, compounds, etc., concentration of starch, and gelatinization temperature, viscosity, pH and type of starch used.

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PSC VARI-PITCH ROVING BUILDER improves running conditions and increases the effective volume of the roving package.

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- Less tangled bobbins
- Less break-backs
- Reduces creeling time

IMPROVES SPINNING

- Lower ends down count
- Longer runs
- Less stuffing-off in handling
- More yardage on bobbin

Fits Whitin and Saco-Lowell roving frames.

LARGER PACKAGE

The effective lead or pitch of the Vari-Pitch screw increases as additional layers of roving are placed on the bobbin, causing the length of stroke to decrease at a rate greater than that of the bobbin diameter. This feature produces a CONVEX TAPER of the bobbin that will add additional weight to the package and give you longer runs per bobbin. The LARGER PACKAGE will also reduce creeling time. You will have less waste by having fewer pieces.

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# BOOKLETS

**T-541 REGENERATION OF ZEOLITE WATER SOFTENERS.** Explains advantages of Lixate Process. International Salt Co., Scranton, Pennsylvania.

**T-542 DYEING SNYTHETIC FIBERS.** Detailed analysis of methods and materials. General Dyestuff Co., 435 Hudson St., New York 14, New York.

**T-543 INDUSTRIAL BRUSHES.** Features use on shears, printing machines. M. W. Jenkins' Sons, Inc., 444 Pompton Ave., Cedar Grove, N. J.

**T-544 WASTE HEAT RECOVERY.** Describes system of waste heat recovery from polluted water. Ludell Mfg. Company, 5200 West State Street, Milwaukee, Wis.

**T-545 WASHERS FOR SCOURING, BLEACHING, ACIDIFYING.** Describes high capacity, continuous process washers. C. G. Sargent's Sons Corp., Graniteville, Mass.

**T-546 NAPHTHOL FOR LIGHTFAST BROWNS.** Booklet describes new, straight, non-substantive naphthol. Naphthol As-BN, for the continuous naphtholation of cotton and rayon piece goods in the dyeing of economical, fast-to-light browns. General Dyestuff Co., 435 Hudson St., New York 14, New York.

**T-547 SOFTENER LUBRICANT, NAPPING AID.** Technical information available on softener, lubricant and napping aid for natural and synthetic fibers, yarns and fabrics. Nopco Chemical Co., Harrison, N. J.

**T-554 INSTRUMENT CATALOG.** Complete information on industrial instrument accessories and supplies. Includes specifications, parts numbers and prices. Catalog 500, Foxboro Co., Foxboro, Mass.

**T-556 HUNTER DYEING EQUIPMENT.** Describes fully with diagrams Hunter Model A Dye Becks. Hunter No/Lap Reels, Model S Dye Kettles. Open Width Dye Kettles. Sample Dye Kettles. James Hunter Machine Co., North Adams, Mass.

**T-557 HIGH ACTIVITY CATALYST.** Technical bulletin describes new catalyst AC-6 which provides increased activity, excellent bath life, minimum odor formation, etc. Monsanto Chemical Co., Plastics Div., Springfield, Mass.

**T-558 CATIONIC DYE LEVELER.** Bulletin TX-34 gives new information on dye leveler for acid colors on nylon tricot and wool through use of Nopco 1438-B. Nopco Chemical Co., Textile Chemicals Div., Harrison, N. J.

**T-561 PUMP POURABLE PASTES.** Bulletin tells how Moyno pumps can pump any textile liquid that can be forced through a pipe, even if highly viscous or corrosive. Robbins & Myers, Inc., Springfield, Ohio.

**T-563 POLYETHYLENE FINISHING AGENT.** Booklet contains information needed to adopt Emulsifiable A-C polyethylene as a finishing agent to any particular process. Semet-Solvay Petrochemical Div., Allied Chemical Corp., 5th Floor T, Rector Street, New York 6, N. Y.

**T-564 HYDROGEN PEROXIDE BLEACHING.** Booklet discusses advantages, operating details and savings in chemical costs of Activated Hydrogen Peroxide Bleaching Process for Cotton Solvay Process Div., Allied Chemical Corp., 61 Broadway, New York 6, N. Y.

**T-566 ETHYLEX GUMS.** Brochure describes properties of hydroxy ethyl ether derivatives of corn starch. Applications of these noncongealing gums in warp sizing and finishing covered. A. E. Staley Mfg. Co., Box 151, Decatur, Ill.

**T-572 DYEING MACHINERY FOR EVERY PURPOSE.** Illustrated literature available on complete line of automatically controlled machinery. Gaston County Dyeing Machine Co., Stanley, N. C.

**T-576 YARN PREPARATION.** Describes products for yarn preparation, printing, finishing. Polymer Industries, Springdale, Conn.

**T-577 STAINLESS DRY CANS.** Information on stainless steel, 75 psi, reverse dished, head dry cans. Can be furnished Teflon-coated if desired. Sims Metal Works, West Point, Ga.

**T-579 AUTOMATIC GUIDING EQUIPMENT.** Catalog shows various types of automatic guiding equipment for accurate cloth guiding. Fife Mfg. Co., Inc., P. O. Box 9815, Oklahoma City, Okla.

**T-580 AIR SLASHER DRYER.** Shows construction and operating details. Proctor & Schwartz, Inc., 7th St. and Tabor Rd., Philadelphia 20, Pa.

**T-581 BUTT-TACKING SEWING MACHINE.** Describes operation, installation of single thread butt-tacking sewing machine. The Merrow Machine Co., 28 Laurel St., Hartford, Conn.

## *fibers and yarns*

**T-601 FORTISAN-36, NEW TEXTILE FIBER.** Includes charts, diagrams, text, presents technical properties. Textile Sales Dept., Celanese Corp. of America, P. O. Box 1414, Charlotte, N. C.

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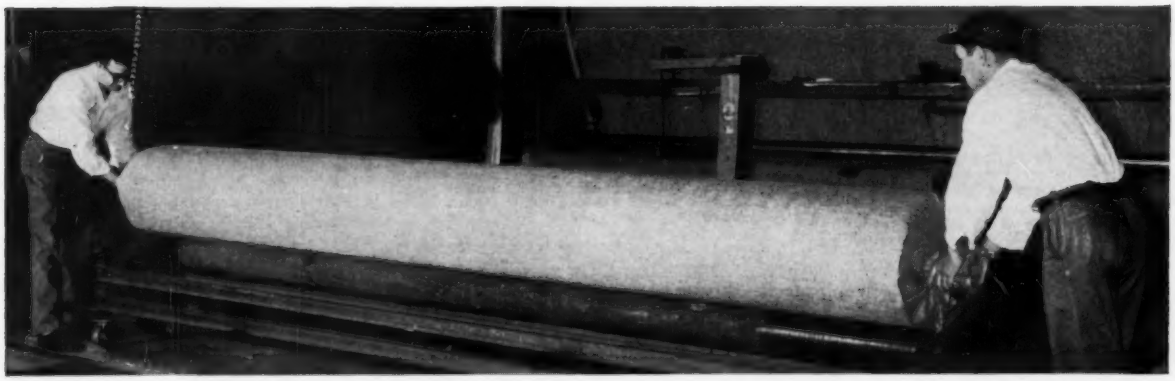

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# BOOKLETS

**T-602** **CAPROLAN NYLON HEAVY YARNS.** Describes strength, long flex life and ready dyeability. Fiber Sales Dept., National Aniline Div., 261 Madison Ave., New York 16, N. Y.

**T-604** **THE CHEMSTRAND NYLON STORY.** Describes the birth and growth of Chemstrand Nylon. Chemstrand Corp., 350 Fifth Ave., New York 1, N. Y.

**T-605** **COLOR-FAST FIBERS.** Further information on "Coloray," Courtauld's solution dyed rayon staple which is a contribution to color fastness in fabrics. Courtaulds (Alabama) Inc., 600 Fifth Ave., New York 20, N. Y.

**T-608** **TASLAN TEXTURED YARNS.** Technical information on dyeing and finishing of new fabrics made with Taslan. E. I. du Pont de Nemours & Co., Wilmington 98, Delaware.

**T-609** **PROCESSING NYLON STAPLE.** Data sheet describes method of processing Du Pont 42 Nylon Staple in blends with cotton. Covers complete operation through sizing. Bulletin N-93. E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

## *laboratory*

**T-701** **TESTING INSTRUMENTS.** Descriptions of 37 instruments for testing textiles. Custom Scientific Instruments, Inc., 541 Devon St., Kearny, N. J.

**T-703** **SHADOGRAPH WEIGHING DEVICES.** Pictures and information on various types of scales. Exact Weight Scale Co., Columbus 8, Ohio.

**T-705** **STROBOTAC.** Measures speed of rotating, reciprocating or other cyclic motions. General Radio Co., West Concord, Mass.

**T-706** **YARN COUNT SCALE.** Data sheet tells how direct-reading instrument provides fast, accurate method of determining yarn number. Exact Weight Scale Co., Columbus 8, Ohio.

## *services for management*

**T-801** **FACTORING SERVICE.** Details on advantages of factoring, including information on general banking and pension plans. Trust Company of Georgia, Atlanta, Ga.

**T-805** **PROFIT THROUGH FACTORING.** Brochure gives facts on the use of factoring as a modern plan for developing sound business growth and added profits. Walter E. Heller & Co., Dept. TT-2, 105 W. Adams St., Chicago 90, Ill.

**T-808** **FACTORING.** Complete details on services offered as mill factors. L. F. Dommerich, 271 Madison Ave., New York, N. Y.

**T-810** **THE WONALANCET WAY** is the title of an editorial booklet published five times a year dealing with current cotton problems. Write Wonalancet Company, 128 Burke St., Nashua, N. H.

**T-812** **BEECHCRAFTS FOR 1961.** Booklet available from Southern Airways Company shows how Beechcraft executive airplanes can save executives time and money. Write Southern Airways Co., P. O. Box 718, Atlanta, Ga.

**T-819** **ORGANIZED LUBRICATION PAYS.** Planning book entitled "Management Practices that Control Costs via Organized Lubrication" shows how to effect savings in five areas of plant operation. Available from Texaco, Inc., 135 E. 42nd St., New York 17, N. Y.

## *plant operation*

**T-902** **BELT LACING EQUIPMENT.** Includes prices, specifications, etc. Clipper Belt Lacer Co., Grand Rapids, Michigan.

**T-903** **"MOTOR SELECTOR."** How to select a-c motors for specific application. Bulletin B-2103. Reliance Electric & Engineering Co., 24701 Euclid Ave., Cleveland 17, Ohio.

**T-904** **GEARMOTORS, MOTORGEARS, AND FLUID DRIVES.** Catalog supplies complete information on double, triple, and quadruple reduction gearmotors and motorgears. Electrofluid and fluid drives are also explained. Link-Belt Company, Dept. PR, Prudential Plaza Chicago 1, Illinois.

**T-907** **WRAP UP LINT PROBLEMS.** Automatic lint filter removes lint from air, winds it into disposable roll. Bulletin 234, American Air Filter Co., 215 Central Ave., Louisville 8, Ky.

**T-908** **TEXTILE MOTORS.** Bulletin describes complete line of textile motors. Diehl Mfg. Co., Finderne Plant, Somerville, N. J.

**T-909** **COMPRESSORS.** WB two-stage water-cooled. Space-saving units require modest foundation up to 125 psi and 1150 cfm displacement. Bulletin WB-10. Gardner-Denver Company, Quincy, Illinois.

**T-910** **MODERN LUBRICATION METHODS.** A report to management tells how modern lubrication methods can help save thousands of dollars in three major economic areas of textile plant management. Describes twelve operating advantages of automatic lubrication systems. Lincoln Engineering Co., 4010 Goodfellow Blvd., St. Louis 20, Mo.

**T-912** **STORY OF NYLON BRISTLE.** Tells of discovery and production, with special attention to "Tynex," a form of nylon ideal for use in brushes. M. W. Jenkins' Sons, Inc., 444 Pompton Ave., Cedar Grove, N. J.

**T-913** **"ONE-SHOT" LUBRICATORS.** Bulletin describes wide field of application for one-shot lubricators on machines requiring closely controlled but infrequent oil feed. Bijur Lubricating Corporation, Rochelle Park, N. J.

**T-914** **INDUSTRIAL GREASES.** Describes multi-purpose lithium soap industrial greases. Sinclair Refining Co., 600 Fifth Ave., New York, New York

**T-917** **BLOWERS AND EXHAUSTERS** Full description, including detailed drawings. Buffalo Forge Co., 490 Broadway, Buffalo 5, N. Y.

**T-918** **PAINT STRIPPING BOOKLET.** Explains simplified method of stripping paint. Oakite Products, Inc., 22 Thames St., New York 6, New York.

**T-921** **CATALOG OF NEEDLE BEARINGS.** Design, application for five types of needle bearings. The Torrington Co., Torrington, Conn.

**T-924** **BALL BEARINGS FOR TEXTILE MACHINERY.** Bearings for all phases of textile processing. The Fafnir Bearing Co., New Britain, Conn.

**T-925** **LUBRICATION OF BEARINGS.** Helpful list of do's and don't to prolong bearing life. New York & New Jersey Lubricant Co., 292 Madison Ave., New York 17, New York.

**T-931** **NEW V-BELT DRIVES.** Bulletin contains information on selection and operation of V-belt drives. Covers all types of V-belt drives. Dodge Mfg. Corp., Mishawaka, Ind.

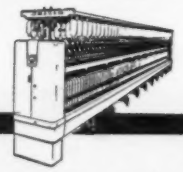
**T-932** **SMOOTH ACCELERATION, DECELERATION.** Describes eddy-current equipment for smooth, stepless acceleration and deceleration. Eaton Mfg. Co., 3307 14th Ave., Kenosha, Wis.

**T-937** **V-BELTS.** Tells how raw materials and finished belts are tested and inspected. Quality control and experimental production covered. Booklet 5-51107, Dept. 794, Goodyear Tire & Rubber Co., Akron 16, Ohio.


# MORE OF WHITIN

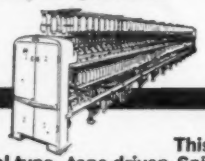
**Whitin builds, in addition to the Model N (shown opposite), other models of Spinning Frames for Cotton and for Wool, Worsted and blends as well.**

PIEDMONT Model K Spinning



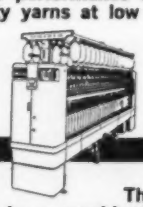
**Introduced as "the most advanced Spinning Frame in the world!" 27" wide, it is unsurpassed for the high speed production of top quality yarns of cotton or spun synthetics.**

WHITIN SUPERFLEX Spinning



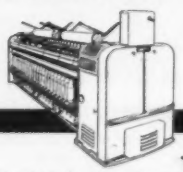
**This 39" conventional-type, tape-driven Spinning Frame is the real "work horse" of the industry with millions of spindles in operation. It has a solid reputation for dependable performance in producing high quality yarns at low cost.**

PIEDMONT Model KW Spinning



**The Piedmont Model KW is a combination of two great developments — the Whitin American System adapted to a Piedmont chassis. The finest frame available for spinning worsteds, long staple synthetics or blends of both.**

FLEX-SPIN Wool Spinning



**The new Flex-Spin Wool Spinning Frame makes available to woolen mills a frame providing maximum production, package size and performance. It features a 16" traverse, reciprocating ring and spindle rails and balloon control rings.**

All these models are outstanding in their fields. All share in design and construction, those distinctive touches so unmistakably Whitin.

WHITIN

# a more profitable way from THIS to THIS

## WHITIN model N spinning

Nearly 500,000 spindles of Model N Spinning for cotton and blends have been sold in just two years. Such rapid success can mean only one thing — that mill men see in it just what they need — a functional, high-value, low-cost frame that's lean, trim and versatile. Compact in design and price, it will repay you with years of outstanding performance and efficient production.

If out-dated, non-competitive spinning is whittling down your profits, now's the time to make your move. Call your Whitin representative today.

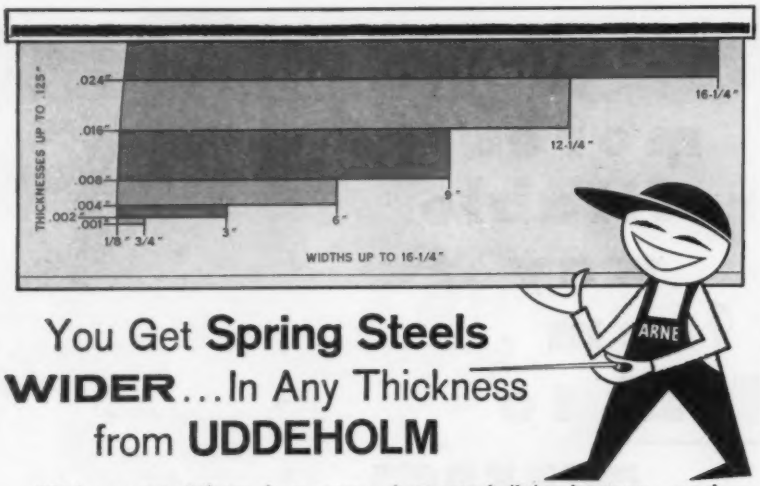
WHITIN

# WHITIN machine works

WHITINSVILLE • MASSACHUSETTS

CHARLOTTE, N. C. • GREENSBORO, N. C. • ATLANTA, GA. • SPARTANBURG, S. C. • DEXTER, ME.

*The best way to better yarns*

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Obtain prompt delivery from warehouse stocks, of popular grades such as Blue Tempered-Annealed, in widths from ⅛" to 16¼" – thicknesses from .001" to .125", as shown in the graph. UDDEHOLM SWEDISH Spring Steels have extra built-in advantages – excellent flatness and finish, close tolerances, uniform hardness and analysis, longer fatigue life! Modern edge-finishing and slitting facilities satisfy your needs exactly!

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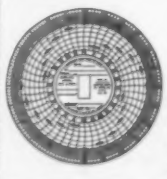
*At Randolph Mills...*

## A WAGNER® INDUSTRIAL RECORDING SYSTEM

***helps maintain production line efficiency***

Randolph Mills uses Tachographs to measure production efficiency and time. When one shift in finishing fell far behind production, a Tachograph showed that the wash range machine wasn't draining water fast enough . . . pinpointed the situation that needed correction.

Tachographs are precision recording devices that can be used anywhere the control of speed, time and measurement is essential to the quality of your products. They can help you determine production peaks and valleys, and non-productive time. Chances are, they can help increase your plant's efficiency. Mail coupon below for full information.



**Wagner Electric Corporation**
6477 PLYMOUTH AVE., ST. LOUIS 33, MO., U. S. A.

*Please send a copy of Bulletin SU-144.*

Name_____
Company_____
Address_____
City & State_____
Proposed Application_____

W161-3


# BOOKLETS

**T-938** **EMERGENCY CHEMICAL CLEANING**—Booklet tells how rust, scale and other deposits may be removed from heat exchange equipment, regardless of intricacy. Anderson Chemical Co., Inc., Box 1424, Macon, Georgia.

**T-939** **BOILER FEEDWATER TREATMENT.** Bulletin describes BRAXON & FLAKO internal automatic boiler feedwater treatment and services of trained service engineers in eliminating the problems of scales, sludge, corrosion, etc. Anderson Chemical Co., Inc., P. O. Box 1424, Macon, Ga.

**T-940** **VARI-SPEED MOTOR PULLEY.** Describes variable speed control through use of simplified three-major-part disc-assemblies with only one lubrication point. Reeves Pulley Co., Reliance Electric & Engineering Co., Columbus, Ind.

**T-941** **BALING PRESSES.** Describes complete line of motor-driven and hydraulic baling presses. Logemann Brothers Co., 3150 West Burleigh St., Milwaukee, Wis.

## *materials handling*

**T-1005** **TRAMRAIL ENGINEERING AND APPLICATION.** Data on how Tramrail equipment can cut handling costs. Cleveland Tramrail Div., Cleveland Crane and Engineering Co., 1036 East 289th St., Wickliffe, Ohio.

**T-1007** **MATERIALS HANDLING FOR TEXTILES.** Shows how fibre trucks can increase efficiency, protect products. National Vulcanized Fibre Co., Wilmington 99, Del.

**T-1013** **TRUCKS DOFF, STORE, BECOME SPOOLER TRAY.** Brochure tells how mobile boxes are being used as doff boxes, storage boxes, and spooler trays on Barber-Colman spooler. Fisher Mfg. Co., Hartwell, Ga.

**T-1014** **CARPET CORES, STORAGE TUBES.** Literature on simplified storage and better cores for rugs. Sonoco Products Co., Hartsville, S. C.

**T-1015** **OVERHEAD CONVEYOR.** Catalog features "Cable-Way" Overhead Conveyor which has low-cost, ease of installation, quiet operation and long life. Conveyor Division, The American MonoRail Co., Fourth and Franklin Sts., Tipp City, Ohio.

**T-1020** **AUTOMATIC WRAPPING.** Tells how automatic packaging increases the sales appeal of textile products. Saves labor and materials and adds tamper-proof product protection. Write Hayssen Mfg. Co., Sheboygan, Wis.

**T-1021** **TUBES, BOBBINS, PIRNS.** Information on world renowned yarn carriers, reliable as to stability, dimensions, weight. Emil Adolff (U. S. A. agents: Textube Corp., 695 Summer St., Stamford, Conn.)

**T-1022** **STRONG CORES.** Data on lightweight, quality tubes and cores for textiles. Star Paper Tube, Inc., Rock Hill, S. C.

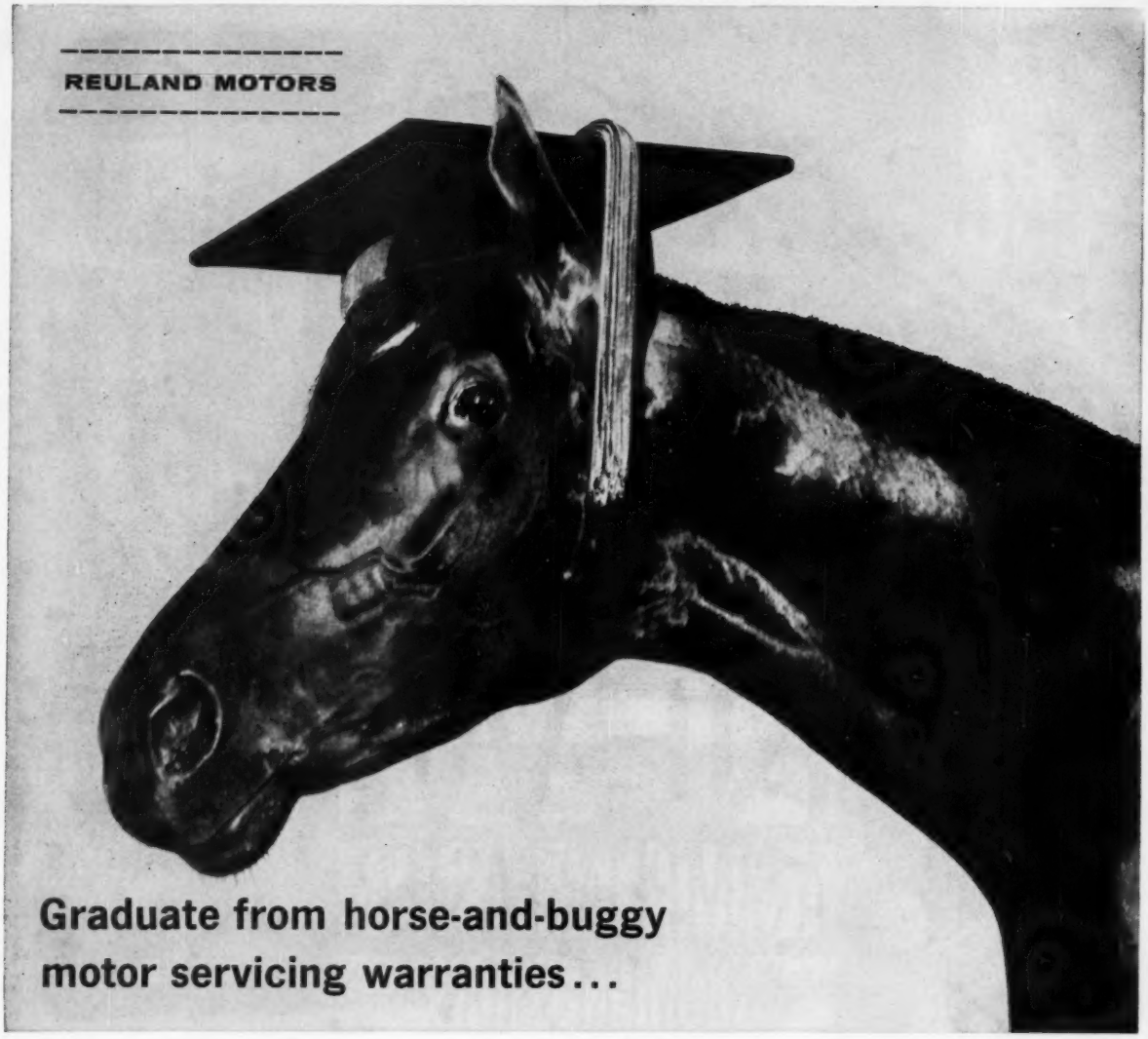
**T-1023** **MATERIALS HANDLING.** Describes lightweight, durable, smooth products. Spaulding Fibre Co., Inc., Dover, New Hampshire.

**T-1024** **CONDITIONING TRUCK.** Details on all-aluminum, non-rusting conditioning truck. Excel, Inc., Lincolnton, N. C.



*For further information use Handy Return Card, Page 201*

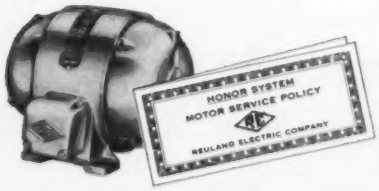
REULAND MOTORS



## Graduate from horse-and-buggy motor servicing warranties...

## with REULAND's "Honor System Motor Service Policy!"

*Reuland's 15 year old service policy takes the word of any motor service shop of your choice.*




Whether you're an O.E.M. or a User, when you buy REULAND electric motors you can make your decision with confidence. One very important reason, of course, is that every motor is backed by REULAND's 15 year old "Honor System Motor Service Policy"... *still* the only one in the industry!

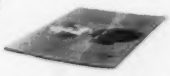
Under this exclusive service policy, *your* choice of any independent motor service shop becomes an authorized REULAND service station. Regardless of where a REULAND motor is in operation, approved service is always next door!

If you would like to talk to a motor manufacturer who really backs up his quality and service claims, find out soon how REULAND can fit into your plans.

EVERY COMPANY SHOULD HAVE A COPY OF REULAND'S OFFICIAL, PRINTED "HONOR SYSTEM SERVICE POLICY!"

*A free copy is available on request. Explains the simple steps to take. Shows how Reuland's unique philosophy of doing business permits it to offer the industry's only Honor System Motor Service Policy. We'll mail yours promptly.*

Our new 8-page general line brochure will come in handy! Also, refer to Sweet's 1961 Product Design File, 7a/RE.



MODERN POWER FOR MODERN-DAY PRODUCTS... *all in lightweight, cool-running aluminum frames!*

# REULAND MOTORS

**REULAND ELECTRIC COMPANY**
Western Division—Alhambra, Calif.
Eastern Division—Howell, Michigan
*Distributors in all principal cities*

NEW!
A SIMPLER, FASTER,
COMPRESSION
STRAPPING
MACHINE

**Acme Steel by-passes frills and fancy housings to produce the most compact and efficient compression strapping machine in the textile industry—the all-new F11**

Even *four different size boxes* per minute are a pushover—thanks to Acme Steel's exclusive dual-height platen regulators. They're only one of many innovations that make the F11 second to none in high productivity and low operating cost. The F11 is a full-size machine. It handles the *complete* compression strapping cycle through effortless pushbutton control. But:

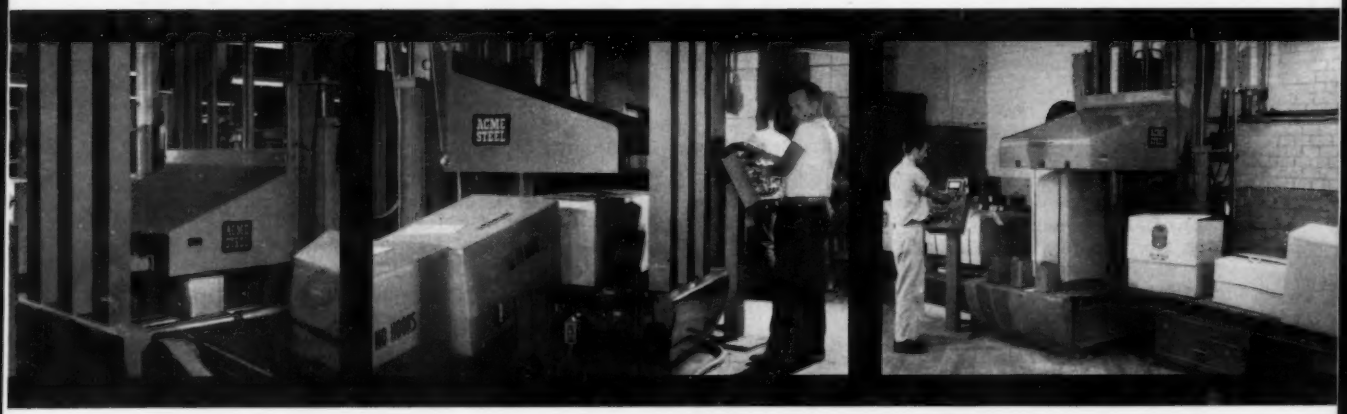
. . . you won't find a pound of unnecessary, space-stealing housings
. . . you won't find a speck of complex and costly electronic circuits
. . . you won't find a seldom used, tacked-on accessory
. . . you won't find a single maintenance problem that takes a crew and a crane to solve.

Four bolts unfasten the strapping mechanism. This slim, trim unit is so simple *one man* can remove it for service—even replace it with a standby—within five minutes.

Basic F11 design has been proved in dozens of installations. Through pushbutton control, you can convey, compress and strap any size box. You can apply three straps at once . . . as many as twelve per minute.

The machine does the adapting, not you. It can be designed to operate pneumatically or hydraulically. It can be set to compress with the exact amount of pressure you want (up to 10,000 pounds). It can be equipped to feed strap through double-face pallets. It can be ordered for fully-automatic or semi-automatic operation. And the portable control console can be positioned in the most convenient location.

More performance per pound and more dependability per dollar is the reason why 50 textile plants are equipped with Acme Steel compression strapping machines (representing over 90% of *all* machines in use). Have your local Acme Idea Man explain all the fine points of this one. Or, return the coupon to arrange to see the F11 in action on film.



You can compress and strap four boxes a minute (even varying sizes) with up to three straps per box. The portable console lets the operator double-up on jobs—like weighing a completed box while the machine straps the next.

The fully-automatic F11 conveys boxes into the machine on powered rollers. A centering device lines up boxes perfectly. Non-compressible units can be strapped without interrupting production thanks to a platen cut-off.

The semi-automatic F11 compresses the box automatically. An anti-canting mechanism keeps the platen level, even on off-center units. (Powered platen rollers and the box centering device are optional on the semi-automatic model.)

ACME STEEL IDEA LEADER IN STRAPPING

Acme Steel Products Division ACME STEEL COMPANY
Dept. TAS-101, 135th Street & Perry Avenue, Chicago 27, Illinois

- ☐ Please send full-facts folder on the new F11 for the textile industry.
- ☐ Contact me to arrange for showing of new F11 movie.
- ☐ Have Acme Idea Man call.

NAME _____

TITLE _____

FIRM _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

# PERSONAL NOTES

**Thomas F. Cahill, Jr.** has joined Bibb Manufacturing Co., Macon, Ga., as assistant director of research and development.

**John B. Whisnant, Jr.** has been appointed vice-president for manufacturing for Congoleum-Nairn, Inc. Mr. Whisnant is headquartered at the new plant located in Lawrence, Mass.

**Thomas J. Fontana** has been elected secretary of Flagg-Utica Corp.

**James S. Love, Jr.,** has been elected a vice-president of Burlington Industries, Inc., in charge of public relations and advertising.

At the annual meeting of the Combed Yarn Spinners Association held at White Sulphur Springs, W. Va., recently, **Albert G. Meyers, Jr.,** of Textiles, Inc., was elected president. **J. L. Barnett** of South Fork Mfg. Co. and formerly president of the association, has been named chairman of the executive committee. **J. J. Hinds** of Botany Cottons has been elected first vice-president.

**Richard Sullivan** has been named director of engineering for Cone Mills Corp. **John E. Field,** president of Cone Mills, Inc., has been elected vice-president of Cone Mills Corp.

**Frank J. Rizzo,** chief of the textile dyeing laboratory, Quartermaster Research and Engineering Command, Natick, Mass., was recently presented the first annual Army Research and Development Achievement Award. Mr. Rizzo was honored for guiding the development of a fully automated instrument which measures and records color differences numerically with a degree of accuracy never before attained.

**Paul A. Koppe, Jr.** has been elected a vice-president of the Rockford Textile Mills, Inc., McMinnville, Tenn.

**James M. Rennie** has been appointed vice-president of Artistic Weaving Co., Pompton Lake, N. J.

**David Krivitsky** has been named to the newly created post of vice-president of sales for Ansonia Mills, Inc., Taunton, Mass.

**W. Rollin Keen** has been named a vice-president of Collins & Aikman and director of Corporate Product Development.

**Vernon Ryan,** formerly head dyer in the cotton dye department of North Carolina Finishing Co., has accepted a position with P. Floro and Sons in Manila.

**Albert V. Morrell,** formerly manager of the fabrics division of The Hellwig Dyeing Corp., has been appointed manager of the York, Pa. plant of United Piece Dye Works.

**Fred N. Slosman** has joined The Slosman Corp., Asheville, N. C. Mr. Slosman will be in charge of production and coordination of processing facilities.

**Edward L. Hankins** has been promoted to manager of manufacturing for Fulton Cotton Mills, Atlanta, Ga.

**George Elbogen,** chairman of the executive committee of the International Silk Association (USA), Inc., recently received a decoration from the Emperor of Japan for his efforts in cultivating the American market for Japanese silk and for his share in re-establishing the Japanese silk industry in the post-war years.

**John L. Severance** has been elected executive vice-president of The Association of Cotton Textile Merchants of New York. Mr. Severance has also been appointed as the association's representative to the General Arbitration Council of the Textile Industry.

**George R. Thompson** has been appointed vice-president and general manager of Fox River Valley Knitting Co., Appleton, Wis.

**S. P. Rice,** formerly manager of the Hillside carpet plant of Callaway Mills Co., LaGrange, Ga., has been elected a vice-president of Callaway Mills, Inc., and named a director of consumer marketing.

At the recent meeting of the personnel managers division of the Georgia Textile Manufacturers Association held in Atlanta, Ga., recently, **Eugene W. Owen** of Canton Cotton Mills, was named chairman. Other officers elected were: vice-chairman—**Virgil E. Adams,** Jefferson Mills, Inc.; secretary — **O. B. Moore, Jr.,** of the GTMA staff.

**Paul Homier** has joined the Lantuck nonwoven fabrics division of West Point Manufacturing Co., Fairfax, Ala., as technical service super-

Shown here are the directors of the personnel club of the Tufted Textile Manufacturers Association. They are (left to right): **Dan Chandler,** Pat-Craft Carpet Mills; **Harry Moore,** Bell Industries; **Neal Dickerson,** James Lees & Son; **Bill Inman,** Cabin Crafts, Inc., **Bert Gallant,** L. A. Lee Co.; and **U. L. Roland,** E. T. Barwick Mills.

# the COCKER SD-49 Spindle Driven Warper

**A Battery of SD-49's in one of the World's Finest Mills**

The Cocker SD-49 is especially designed to handle large, heavy section beams with any type yarn from finest deniers to heaviest tire cord yarns. It produces warps of any desired density at speeds up to 1000 YPM. Here are some of its outstanding advantages.

### CONSTANT SPEEDS

An adjustable rheostat permits the selection of any desired speed. This speed is maintained by Cocker's extremely accurate system which measures the RPM of the presser roll instead of using less sensitive controls which are based on pressure or buildup. DC or clutch type motors provide smooth and gradual acceleration.

### CONSTANT DENSITIES

Presser roll travel is in a horizontal plane to assist in providing a constant density during beam buildup. A large capacity pneumatic cylinder and an indicating gage permit operator to accurately adjust the loading of the roll against the beam and achieve any desired result.

### DOUBLE-END BRAKING

Carrier and presser rolls and driving jackshaft have rheostat-controlled electro-magnetic brakes. The jackshaft brake applies braking action TO BOTH ENDS OF THE BEAM and prevents beam damage due to sudden stops—an exclusive Cocker feature.

### VIBRATIONLESS OPERATION

The base of the SD-49 is heavy machined cast iron and all components, side frames, presser roll assembly, drive, etc. are mounted on it. This rugged construction permits vibrationless speeds up to 1000 YPM.

## Specifications

- Standard Capacity 36″ dia. x 54¼″ width beam. Other diameters and widths available.
- Electric pre-determining counter clock
- Electric speed indicator
- Collecting eyeboard in back of machine
- Positive zig-zag front expansion comb
- Pushbutton controls on both sides of machine
- Loading and doffing by pneumatic cylinder

**Write for Full Information**

## COCKER MACHINE & FOUNDRY COMPANY

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Oxford 7-2242

**IN MEXICO:**
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**WORLD'S LARGEST DESIGNERS AND BUILDERS OF COMPLETE WARP PREPARATORY EQUIPMENT**

## PERSONAL NOTES

*(from page 192)*

visor. Mr. Homier will assist in developing new products and expanding present markets.

**T. J. Meyer** has been promoted to assistant manager of the Johnston division of Riegel Textile Corp. * * * **Clyde Thomas,** assistant superintendent in charge of printing at the Trion, Ga., division, has been transferred to the Ware Shoals division. **M. G. Michael,** overseer o printing at Ware Shoals, has moved to the Trion division. **Thomas M. Griffin** has been promoted to assistant dyer at the Trion division.

**Lawrence T. Carter** has assumed duties as superintendent of the new hosiery finishing plant of Holt Hosiery Mills, Inc., Burlington, N. C.

**John Thomas** has been named superintendent of the Menantico Bleachery, Millville, N. J., a division of Millville Manufacturing Co.

**J. Cranston Gray** has joined Berkshire Hathway, Inc. Mr. Gray will have complete charge of all manufacturing and full responsibility for the operation of all seven plants of the firm.

**Ralph D. Holt** has been named treasurer and secretary, as well as a director of Cranston (R. I.) Print Works Co., succeeding **F. Gordon Blackstone,** who has retired.

**William C. Brenner,** vice-president in charge of manufacturing for Berkshire Knitting Mills, Reading, Pa., has retired. Mr. Brenner will continue as a consultant until the end of the year.

### OBITUARIES

**Charles E. Dearnley,** 69, president of Dearnley Bros. Worsted Spinning Co., Inc., Germantown, Pa.

**David L. Howard,** retired general manager of Brookford Mills, Hickory, N. C.

**Robert O. Jones,** 87, former director of Grantville (Ga.) Mills and served as a director and attorney of the Newnan (Ga.) Cotton Mills.

**Robert M. Leach,** sales engineer for Herr Mfg. Co., Inc.

**Robert B. Moffit,** 53, director, vice-president, and treasurer of Woods Mfg. Co., Ltd., Montreal, Canada.

**Theophil H. Mueller,** 69, former president of Julius Kayser & Co., now Kayser-Roth Corp.

**Charles P. Raymond,** president and manager of the Charles P. Raymond Service, Inc., Boston, Mass.

**A. E. Rhash,** 56, former president of the Skyland Hosiery Co., Asheville, N. C.

**Alan G. Stanford,** 67, vice-president of Robert & Co., Atlanta, Ga.

**Dr. Fred R. Taylor,** 83, retired cotton technologist, Clemson, S. C.

**Eugene A. Bonte,** 72, president of Bonte Spinning Co., Inc., Woonsocket, R. I.

**Charles W. Causey, Sr.,** 81, retired officer of Pomona Mills, Greensboro, N. C., and Lowe Mfg. Co., Huntsville, Ala.

**Harold W. Coward,** president of Alliance Color & Chemical Co., Newark, N. J.

**Luke J. Castile,** 69, retired representative for The Keever Starch Co., Charlotte, N. C.

The addition at the Butner, N. C., plant of **Athol Manufacturing Co.** has been completed. The Athol, Mass. operation has been transferred to the Butner location.

An addition to the present building has been announced by **Austin Knitting Mills, Inc.,** of Albemarle, N. C. The 24,352 sq ft of space will be utilized for manufacturing and shipping.

**Joseph Bancroft & Sons Co.,** Wilmington, Del., has announced that the firm has been named exclusive international licensing agent for certain patents owned and controlled by the **Fabric Research Laboratories, Inc.,** Dedham, Mass. The patents involved relate to methods for treating fibers, filaments, and yarns.

**Bay State Dyeing & Finishing Co.,** Bondsville, Mass., has announced plans to move into the new plant under construction in Morganton, N. C., by late fall.

**The Borden Co.** has announced acquisition of **Columbus (Ga.) Coated Fabric Corp.** The facility will continue with its present management and name, and will be operated as a division of the parent firm.

**Clinton (S. C.) Mills** plant No. 1 is being enlarged and modernized. When completed, the facility will be air conditioned and will house all manufacturing processes.

**Crompton-Richmond Co., Inc.** has announced plans to expand in the field on polyester/cotton blends and other synthetic blends. William G. Lord, II, has been named merchandise manager of cotton and synthetic fabrics division.

**The Dover Textile Group** has launched a $1 million expansion program which will include Dover Mill Co., Ester Mill Co., Ora Mill Co., Dover Yarn Mill, and Dora Knitting Co.

The outerwear fabric operation of **Exeter (N. H.) Manufacturing Co.** has ceased. Some new equipment has been installed for the expansion of industrial products.

**Erie Avenue Mills Co.,** Philadelphia, Pa., has been purchased by F. C. Rohmer and W. A. Helmig.

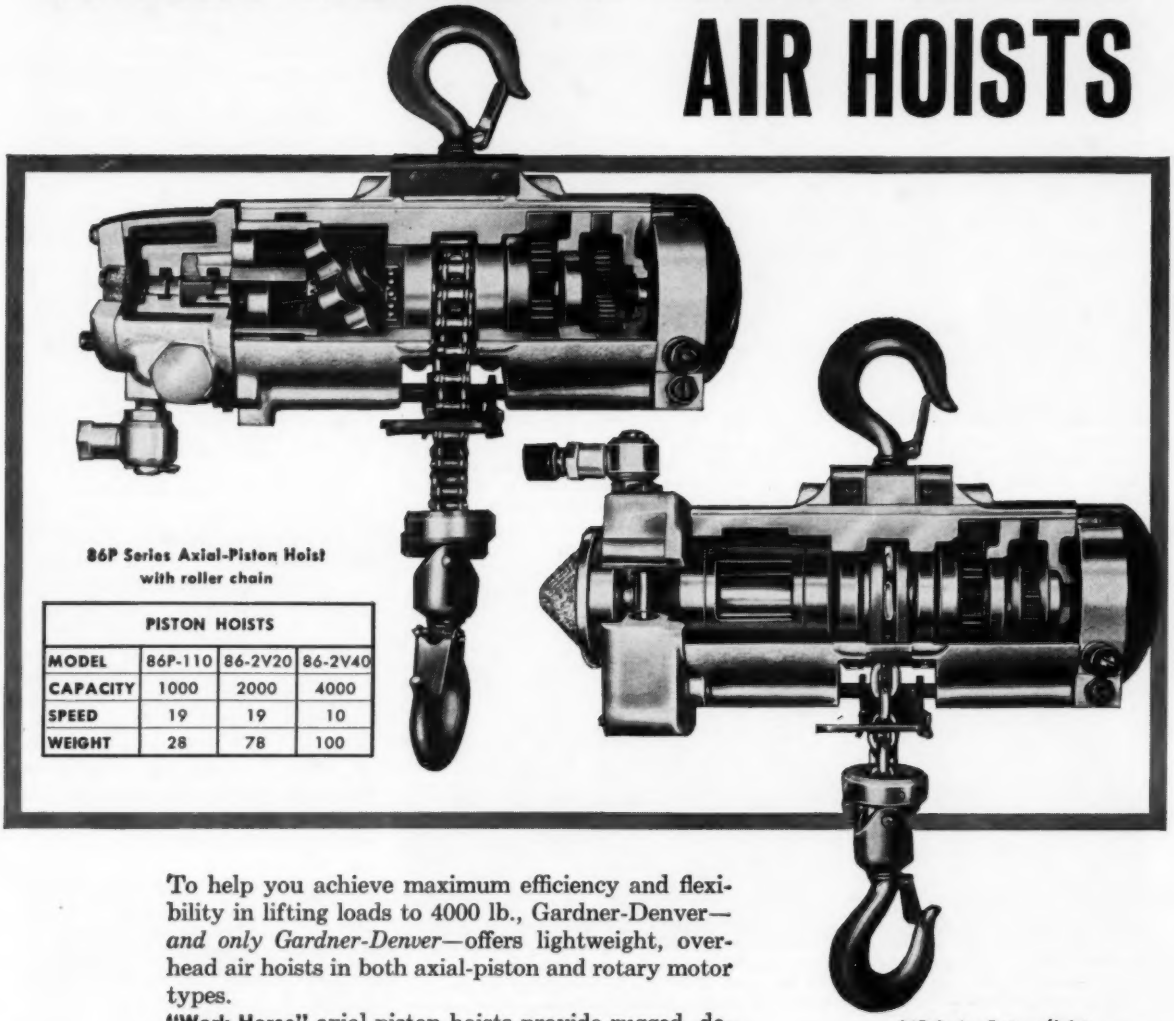
A new hosiery mill, the **Gold Seal Manufacturing Co.,** has started operations in Charlotte, N. C.

A new finishing plant will be constructed in Alamance Industrial Park, Burlington, N. C., by **Holt Hosiery Mills, Inc.** The facility will have approximately 50,000 sq ft of floor space and will have the capacity of 25,000 dozen pairs of ladies' hosiery per week.

The **L. & S. Hosiery Co.,** finishers

## to lighten your lifting cost load...

# "WORK HORSE" or "RACE HORSE" AIR HOISTS



**86P Series Axial-Piston Hoist with roller chain**

| PISTON HOISTS | | | |
|---|---|---|---|
| MODEL | 86P-110 | 86-2V20 | 86-2V40 |
| CAPACITY | 1000 | 2000 | 4000 |
| SPEED | 19 | 19 | 10 |
| WEIGHT | 28 | 78 | 100 |

To help you achieve maximum efficiency and flexibility in lifting loads to 4000 lb., Gardner-Denver—*and only Gardner-Denver*—offers lightweight, overhead air hoists in both axial-piston and rotary motor types.

**"Work Horse"** axial-piston hoists provide rugged, dependable operation where load *control* is the important factor.

**"Race Horse"** rotary air hoists are designed for use where the combination of speed and ruggedness is the major consideration.

**Both types** provide variable speed, spark-resistant operation, powerful brake and precise control. Popular models available from 150- to 4000-lb. capacity.

**86R Series Rotary Hoist with link chain**

| ROTARY HOISTS | | | |
|---|---|---|---|
| MODEL | 86R-5 | 86R-10 | 86R-20 |
| CAPACITY | 500 | 1000 | 2000 |
| SPEED | 90 | 40 | 20 |
| WEIGHT | 27 | 27 | 30 |

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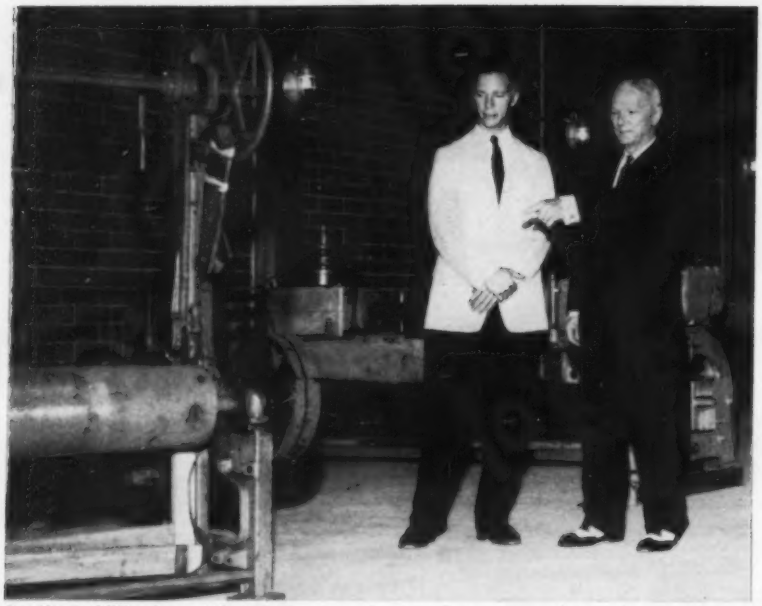
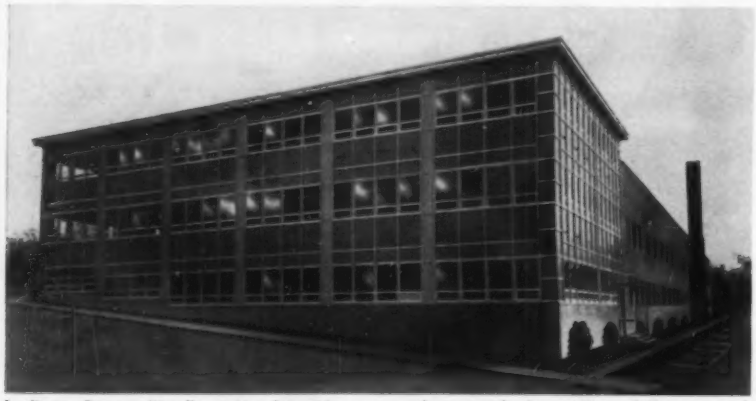


**Southern Mills, Inc.,** Atlanta, Ga., recently opened its new synthetics division plant at Senoia, Ga. (TI for Sept., 1961 page 180), the town in which its fiber fabrics division is located. Pictured here during construction of the synthetics fabrics plant is William D. Ellis (right), president of the firm, pointing out to his son, Douglas, features of a new machine being installed.



**Ludlow Corp.,** Needham Heights, Mass., recently opened this million dollar research center which is completely equipped with the latest laboratory equipment for the development of new products in the textile, papers, and plastics fields. The textile section contains a full complement of chemical and physical testing equipment for analysis and expermentation on jute and other natural and synthetic fibers. A large development area is devoted to pilot equipment which duplicates the production operations carried on in Ludlow's eight textile plants.

of children's and misses' hosiery, has moved to Newton, N. C.

A new apparel fabrics division which will offer woolens, worsteds, synthetics, and blends, has been established by **Troy Mills, Inc.,** Troy, N. H. Julian Waldman has been appointed manager.

**West Point (Ga.) Manufacturing Co.** has announced plans for the construction of a million dollar Martex towel warehouse near Fairfax, Ala. Full operations are expected to be underway during early 1962.

**Mount Hope Finishing Co.** has announced the completion of the 12,000 sq ft addition to the Butner, N. C., plant. New equipment is being installed. The facility houses a new color room, an air conditioned dyehouse office, a continuous dyeing range, and new schreiner calendering equipment.

**Armtex, Inc.,** Pilot Mountain, N. C., has opened a Gastonia division in the vacant Piedmont Mill. The firm will manufacture knitted outerwear and swimwear fabrics. Lester E. Cutler has been named plant manager.

Meltons and fleece-type fabrics are being produced by **Marshfield Mills, Inc.,** East Dedham, Mass. Herbert Smith is plant manager.

Arrangements have been completed under which the entire operation of **Merit Underwear Co.,** Shoemakerville, Pa., will be operated as a division of **Flagg-Utica Corp.** No change in management is anticipated.

**North Carolina Knitting Co.,** Dallas, N. C., a division of Fairtex Co., has ceased operations.

**Old Forge Throwing Co.,** Old Forge, Pa., recently moved to 217 E. Drinker St., Dunmore, Pa.

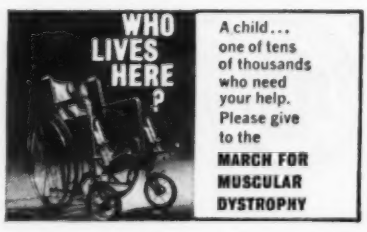
**Pottsville Bleaching & Dyeing Co.,** Port Carbon, Pa., has announced plans for an 18,000 sq ft addition to the present plant. The new facility will enable the firm to process 75,000 pounds of bleached and dyed tubular fabric per day.

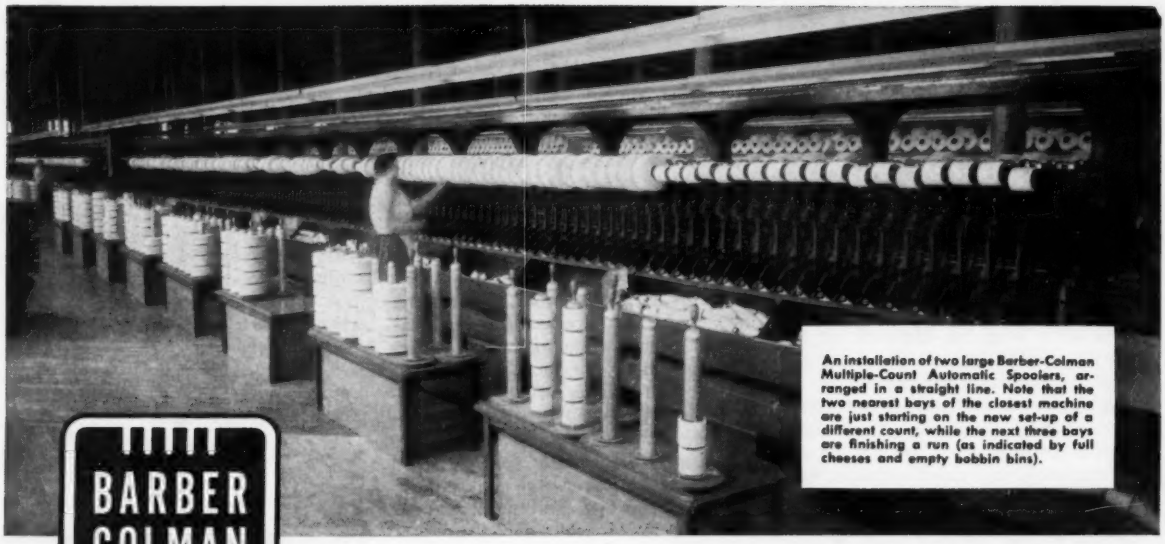
Wind Creek Park, located on Lake Martin and six miles from Alexander City, Ala., was recently opened to the public. The park was donated by **Russell Manufacturing Co.,** Alexander City, Ala.

**A. M. Smyre Mfg. Co.** has purchased 80 new spinning frames equipped with magnetic top rolls, President Fred L. Smyre, Jr. announces. The frames represent a total of 19,200 spindles and will be installed in the company's No. 2 plant at Ranlo, N. C., replacing older machinery in use there.

**American Cord & Webbing Co., Inc.** has announced acquisition of **Manchester, N. H., Narrow Fabrics Co.** The new division will operate under present management as **Acro Textile Co., Inc.**

**The American Thread Co., Inc.,** has announced plans to transfer the Bristol, Tenn., sales, distribution, and trucking activities to the Sevier, N. C., finishing plant. Operating efficiency and improved customer service were reasons for the move.

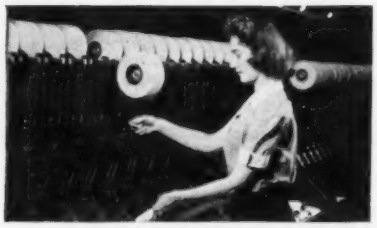





An installation of two large Barber-Colman Multiple-Count Automatic Spoolers, arranged in a straight line. Note that the two nearest bays of the closest machine are just starting on the new set-up of a different count, while the next three bays are finishing a run (as indicated by full cheeses and empty bobbin bins).

BARBER COLMAN

# Multiple-Count Automatic Spooler



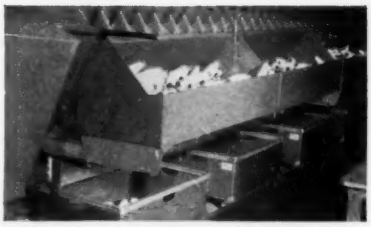
Spooler tender loading a full bobbin into the Spooler. The bobbin is dropped into a "pocket," and the yarn end is slipped into a spring clamp which positions it properly for the knotter to pick up.

Yarn man moving a trident of full cheeses from operator's table to a creel truck. He also returns tridents of starters, removes boxes of empty bobbins, and keeps full-bobbin bins supplied. Boxes under operator's tables are for tailings, and cheeses to be rewound.

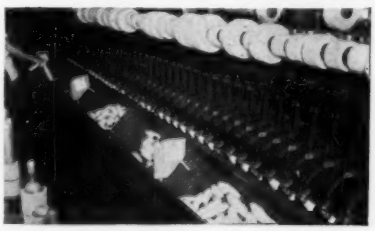
Sale yarn mills and producers of piece goods that use various counts or different mixtures will find that this machine can be a very profitable investment. It is still the famous and the very familiar Barber-Colman Automatic Spooler, but with this difference: now you can wind . . .

## A DIFFERENT COUNT EVERY NINE UNITS

The machine is built in "bays" between uprights that support the traveler track, with nine bobbin-to-cheese winding units on each side of each bay. Empty bobbins, instead of being conveyed to a single sorting table, drop into separate boxes under each bay, thus enabling each group of nine units to be used for a different yarn count. Individual operator tables service each bay. The only limitation is that the extremes of different counts on the machine at any one time must fall within the range of the knotter in the traveler. Yarn or count changes can, of course, be readily made at any time, and any number of bays can be run on identical yarns.



A close-up of the full-bobbin supply bins which are fixed to the machine, one bin for each nine winding units. The removable empty-bobbin boxes are shown on the floor below, also arranged so there is one box for each nine units. Note box location guides.



A close-up of several full-bobbin bins showing how dividers can be used to mark off separate runs. Labels tell contents.

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## BOOKS

*Principles of Knitting Outerwear Fabrics and Garments*, a manual on basic stitch formations and machine types, was prepared primarily for personnel in knit goods manufacturing plants, but it is so simply written and well illustrated that it may be used as a text for students of the subject as well. Aim in preparing the book, which is a compilation of articles from the "Knitted Outerwear Times," was to present the fundamental principles on which the art is bottomed, the major elements contributing to stitch diversity, and a review of machines commonly in use in the United States, together with an exposition of their distinguishing principles of operation. Among subjects dealt with in the 16 chapters are: V-bed flat knitting, circular jersey and rib knitting, circular Jacquard fabrics, flat and circular Links knitting, spring needle knitting, full-fashioned knitting, and warp knitting. Publisher: National Knitted Outerwear Association, 386 Park Ave., South, New York 16, N. Y. 194 pages, cloth bound, $5.00 to association members, $7.50 to others.

In *The Cost-Minded Manager* John D. Staley, director of industrial relations at Genesco, explains why continuous attention to costs is a key element of every executive's job and shows how to establish an executive cost reduction and control program. After analyzing the basic concepts of cost control and revealing how to get real cooperation throughout an organization for a cost reduction program, the author discusses the human factors involved, including the role of the supervisor, motivation, rewards, and incentives. He then goes on to show specific ways of controlling labor and maintenance costs, how work simplification and methods improvements can produce savings, and how cost data are collected, analyzed, and acted upon. Publisher: American Management Association, 1515 Broadway, New York 36, N. Y. 288 pages, cloth bound, $6.75.

*The Employment Interview* reports on two surveys of current interviewing practices in 273 companies and 140 college placement offices. The author, Milton Mandell, discusses every aspect of the employment interview and analyzes the common shortcomings of interviews and interviewers and suggests how to avoid them. Ranging from interviewing methods and procedures, through the selection and training of interviewers themselves, this research study comprehensively reports on a basic element of company recruitment. Statistical data and 28 pages of reproductions of actual personnel forms used by leading firms for various kinds of interviews add to the usefulness of this book. Published by American Management Association, 1515 Broadway, New York 36, N. Y. 110 pages, paper bound, $4.50.

How to develop competent, self-reliant subordinates and thus strengthen your company's competitive position and increase your own chances of success as a manager is the thesis of *Developing Competent Subordinates*, a recently published book by James Menzies Black, assistant director of personnel administration for the Pennsylvania Railroad. The book reveals opportunities for the responsible supervisor to develop individual workers who report to him. It shows how he can give more time and thought to the basics of worker education, improve his own skills in communication, organize his department to realize the technical and managerial potential of his personnel, and at the same time improve his own performance and skills. Committees, conferences, job rotation, and other management development tools are discussed, and practical suggestions are given for dealing with problem employees. Publisher: American Management Association, 1515 Broadway, New York 36, N. Y., 128 pages, cloth bound, $4.50.

A comprehensive manual on servicing electric Clarklift fork trucks is titled *Servicing the Clarklift Electric*. Industrial Truck Division, Clark Equipment Company, Battle Creek, Mich., 94 pages, $2.00.

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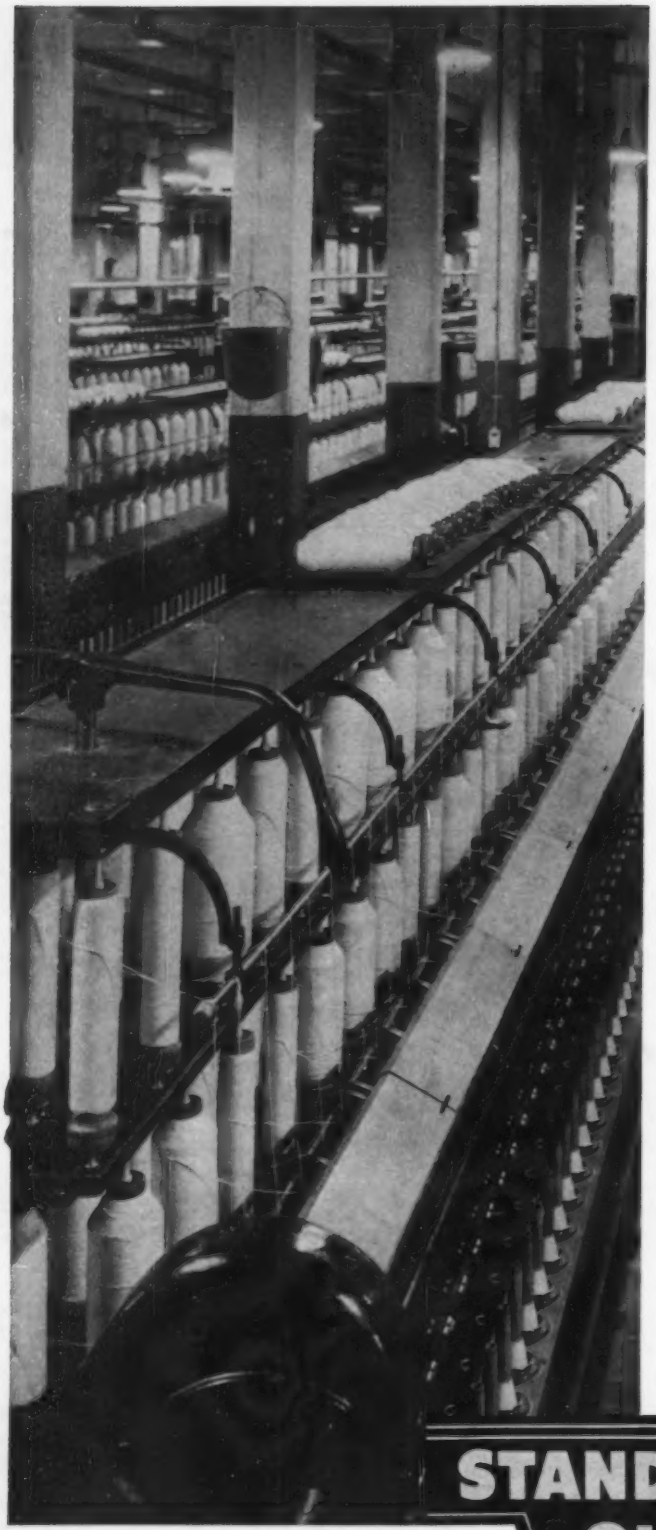

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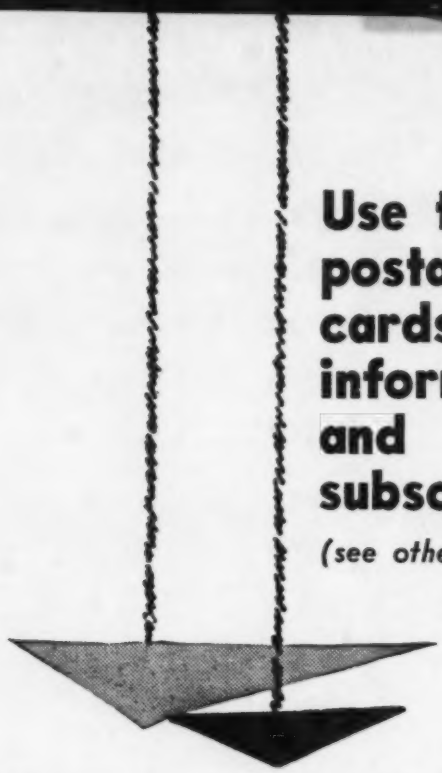

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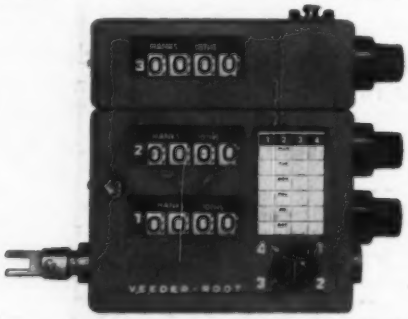

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